AUTOMOTIVE INDUSTRIES

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This Week

For some time there has been speculation on the effect of the new railroad fares on bus transportation. On page 866 Riley E. Elgen analyzes the situation with a whole array of facts and figures to back his conclusions. It is interesting.

Strange as it may seem the parts companies are really making money. A digest of their earnings from 1925 to 1935 will be found on the four pages beginning with 871.

Internal combustion studies, noise treatment, and how body styles are born are a few of the things discussed in some more of the papers delivered at the S.A.E. Summer Meeting and digested on pages 877 to 880 inclusive.

Bonus Buying Begins

Flow of Two Billions into Channels of Trade Expected to Hold June Sales Near May Level

By Harold E. Gronseth

Retail activity clings persistently near the spring peak as the motor industry goes into the summer months. Contrary to expectations and reversing the seasonal trend, June sales of a number of companies got off to a better start than in May. As a whole the industry so far this month has enjoyed a retail volume just about on a par with the similar period in May and just ahead is the spending of the veterans' two billion dollar bonus to bolster business during the remainder of the month and probably far out into the summer.

Some time will elapse between the receipt of the bonus bonds now being distributed and their conversion into cash so that the immediate effect of this anticipated stimulus on motor car buying cannot be determined for a week or two. Dealers, however, report that this type of business has started. Some orders have been placed calling for delivery as soon as checks for the bonds are received.

While some advance business has been done on credit in anticipation of the bonus, the amount is said to be small. The greatest direct benefit is expected to be felt by the used car market. General opinion is that the stimulus to new car business will not be so pronounced and will be spread over a longer period reaching the dealer indirectly through other channels into which the money first flowed.

In view of the persistent strength of the retail market and no doubt anticipating increased activity from the bonus distribution, several plants have raised their production schedules for current month and the usual seasonal tapering off is being pushed farther out into the summer.

Conservatives in the industry with their eyes on the calendar are not ready to concede that the impetus which bonus money might give to sales will more than offset the normal seasonal decline. They still look for the current month to fall slightly under the May volume, estimated at 385,000 passenger cars and 62,000 trucks in the domestic market, but they have had to revise upward their June projections after seeing the auspicious start that has been made and are now willing to admit that it will be a close race between the two months. Only twice in the past 10 years have June retail sales exceeded May. That was in the abnormal years of 1932 and 1933. The aggregate May volume for the 10-year period showed an excess over June of 374,590 cars and trucks, or a good month's business. The average decline from May to June was 11.3 per cent. A year ago, without the benefit of any special stimulus, the decline was only 3.7 per cent.

The millionth General Motors car produced during the current calendar year was turned out on Monday, June 15, 54 days ahead of the same event in 1935. The car was a Chevrolet Master DeLuxe sedan from the Flint plant.

Excellent crops and crop prospects are reported by Chrysler dealers in the Mississippi valley as responsible for a decided upturn in June business, which is expected to be larger than May and

(*Turn to page 862, please*)

Ford's 33-Year Net

Cameron Gives Financial Summary On Company's Birthday Eve

Tuesday, June 16, was the 33rd birthday of the Ford Motor Co. and in his radio talk the preceding Sunday night, W. J. Cameron announced that net income during the company's history had totaled $782,016,144. Divided by the 24,500,000 cars which it has produced, this would bring the company's net per car to approximately $32. But Mr. Cameron explained that through the sale of by-products the net had been materially increased from outside sources and that per car it amounted to approximately $20.

Of a total gross of $12,951,338,028 taken in during these 33 years, Mr. Cameron went on to show that 94 per cent had been actually paid out into the expenses of the business. Upon the remaining 6 per cent, the speaker spent some time to show how it, too, had been used up in material wealth.

Explaining the true way in which wealth is increased, Mr. Cameron, pointed out that "for each 100 per cent of raw or unfinished *material values* that came into our factories, 150 to 300 per cent in material values went out."

Texas Motor Exhibits

GM, Ford and Chrysler Represented at Centennial Exposition

The big three of the motor world were very much in evidence as the gates of the Texas Centennial Exposition at Dallas opened early this month. The interior of the Chrysler exhibit, featuring a background of sea blue mirrors, is one of the most beautiful at the fair. The "mechanical man," made entirely from automobile parts, is a feature of the exhibit, and makes comments on those who pass by. Two marionette shows, one presenting the Chrysler sales story complete with min-

(*Turn to page 883, please*)

U. S. Plants Not Barred in Japan

New Law Permits Operations on Scale of Last Aug. 9; Parts and Machines Duty-Free for Native Factories

Special to AUTOMOTIVE INDUSTRIES

Japan's new Automotive Industry Control Act, passed recently by a special session of the Diet, will not interfere with the activities of foreign companies' operations in that country, so long as they are not expanded beyond the scale on Aug. 9, 1935, when the government announced its intention of putting the law into effect, according to the latest advices.

Chief features of the new law are:

1. Automobile assembling and the manufacture of the principal parts will be permitted on license, but no license will be required for an enterprise which is unable to manufacture more than a number of cars to be fixed at a later date. (This number will be presumably five to six thousand cars a year.)

2. Companies granted licenses will be exempted from income taxes and business profits taxes for the first five years of their existence.

3. Companies granted licenses shall be joint-stock companies which have a majority of shares or rights vested in

(Turn to page 862, please)

Building Activities

Allis-Chalmers and Three GM Units Among Those Who List Plans

Allis-Chalmers Mfg. Co., Milwaukee, has decided upon an enlargement program to cost between $750,000 and $1,000,000 at its branch works in Springfield, Ill., where it manufactures heavy-duty tracklaying tractors and other heavy hauling units. For the present, it was stated, no enlargement of the farm tractor division at the main works in West Allis (Milwaukee) will be undertaken, although for several months the demand has exceeded the production capacity of 80 units daily.

Fisher Body Corp. is starting work at Janesville, Wis., on an addition, 120 x 640 ft., to house unloading docks and warehouse space. The addition will enable the plant to handle all materials under roof, spur tracks to run through the center of the addition.

The first of two additions to the General Motors malleable iron plant at Saginaw, Mich., is scheduled to start Sept. 1 and will provide 15 to 20 per cent additional production capacity. The second addition will be a continuation of the present annealing room.

Additions to the General Motors plant at St. Catharines, Ont., to cost $550,000, has been announced by W. A. Wecker, general manager of McKinnon Industries. About 500 additional workers will be employed on construction.

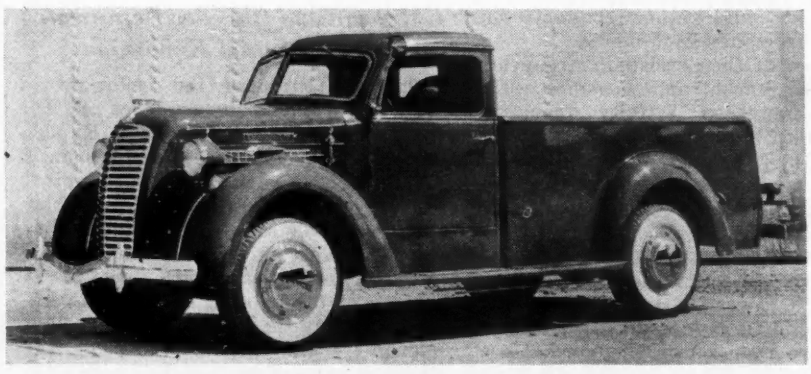
Twin Disc Clutch Co., Racine, Wis., has placed contracts for the construction of an addition increasing the usable floor area of the factory by from 3500 to 4000 sq. ft.

Masco Screw Products Co., Detroit, has acquired the manufacturing building at 2700 Franklin St. The building, which will provide nearly three times the manufacturing space now available, will permit the installation of additional automatic machinery and will greatly increase the company's capacity. Production at the old quarters has been operating on 24 hour daily schedules for some time. The offering of 120,000 $1 par shares of common stock has been oversubscribed and provides the funds needed for the current expansion program.

Knight Screw Products Co. is planning the purchase of adjoining land and the erection of an addition to the plant for the housing of modern automatic equipment. Specialized hollow-ground products will be added to the company's present line when expansion is complete. A block of 63,096 shares of common stock is to be offered at an early date.

For the purpose of constructing a new plant and to provide additional working capital, the Detroit Forging Co. is offering 250,000 shares of $2 par common stock. The new plant will provide room for more efficient equipment and will permit operations at least 16 hours a day, whereas in the present location, work is confined to daylight hours through zone regulations.

Gillette Rubber Co., Eau Claire, Wis., has placed contracts for the erecting of a second-story addition, 200 x 600 ft., to the tire building, and a 50 x 130-ft. addition to the banbury building. The concern is being operated on a full 24-hr. basis, with some three 8-hr. shifts and a number of four 6-hr. shifts.



Diamond T ¾-ton Model 80 with de luxe cab and 8-ft. pick-up express body

W. E. FLETCHER, formerly with the Fruehauf Trailer Co., has been appointed manager of the tank division of Gar Wood Industries, Inc., Detroit.

J. L. BALLARD has been appointed director of distribution of the De Soto division of Chrysler Corp., succeeding **C. W. BLOOM** who has been assigned to the staff of L. G. Peed, vice-president.

L. W. GROTHAUS has been elected vice-president of Allis-Chalmers Mfg. Co. He has been with the company 32 years and during the war served as a member of the War Industries Board.

DR. EDWARD E. PRATT, formerly Chief of the Bureau of Foreign and Domestic Commerce and well known for his work in foreign advertising and merchandising, has been appointed sales promotion manager of the export division of Chrysler Motors. **ROBERT B. POWERS,** who formerly worked in the capacity of both advertising and sales promotion manager, will give his full attention to advertising in the future.

A. A. ANDERSON, president of Hayes Body Corp., has been elected a director of Hupp Motor Car Corp. to fill a vacancy created by the resignation of V. R. Drum.

M. E. PETERS, formerly assistant manager of the National Automobile Dealers' Association, has joined the John O. Munn Co., as vice-president. The company is engaged in marketing service for automobile dealers.

GLEN F. MOONEY, executive manager of the European division of the Chryser Corp., export division, returned to Detroit this week after a trip of four and a half months in Europe and the Near East.

RALPH K. SUPER has been appointed chief engineer of Linderman Devices, Inc. Mr. Super has for the past six years been in charge of the development of brake equipment with Mack International Motor Co.

P. E. GARLAND was recently appointed assistant works manager for the Federal Mogul Corp., Detroit. Mr. Garland was master mechanic at the Timken-Detroit plant for a number of years.

R. S. DRUMMOND, president of the National Broach and Machine Corp., Detroit, sailed for Europe this week on an extended business trip.

Earnings Statements of Automotive Companies

	1st Quarter 1936	1st Quarter 1935
Caterpillar Tractor Co.[1]	$3,673,469	$2,404,284
Consolidated Aircraft Corp.	3,730	322,731
Continental Motors Corp.[2]	105,177*	471,659*
Firestone Tire & Rubber Co.[2]	2,754,675	2,155,084
Gabriel Co.	8,022*	20,927*
Graham-Paige Motors Corp.	186,240*	120,397
Hercules Motors Corp.	111,438	95,644
Lee Rubber & Tire Corp.[2]	101,297	112,970
Pines Winterfront Co. [3]	181,710*	263,090*
Raybestos-Manhattan, Inc.	365,721	310,633
United American Bosch Corp.[4]	188,998†	55,079†

* Net Loss. † Before Federal Taxes. [1] Figures are for five months ending April 30. [2] Figures are for six months ending April 30. [3] Figures are for 12 months ending April 30. [4] Figures are for 12 months ending March 31.

Plymouth Pistons Cooled To Check Size Accurately

A new system for cooling pistons, developed by the Plymouth Division of Chrysler Corp. and installed since publication of the special feature in AUTOMOTIVE INDUSTRIES April 4, 1936, is the latest contribution to precision measurement of vital engine parts. The new units provide accurate temperature control at the point where the pistons are checked by Electrolimit gages for size, and eliminate the possibility of minute variations in piston size which might be due to temperature differences.

By means of the new system all pistons reach the gages at a temperature of exactly 78 deg. Fahr. Uniform temperature controls have been installed and are now in operation on the four piston conveyors which run to the final inspection tables. Pistons now move without delay on the piston conveyor chains which lead to the electric gages, passing through cooling tunnels, which are horizontal metal cylinders, insulated on the outer surface, and containing thin-walled water jackets. Water flowing around the jackets cools the pistons to the temperature desired for the test.

Road Surveys Begin in 27 States

Findings Will Govern Future Improvements, Based on Economic Importance of Highways

State highway departments with the cooperation of the Bureau of Public Roads of the Department of Agriculture have instituted highway planning surveys in 27 states, work will begin soon in six states and three states have indicated a desire to conduct surveys. The Bureau of Public Roads, in announcing the surveys, said that they are intended to collect information so that future highway improvement may be conducted on a sound, business-like basis.

Heretofore attention has been directed chiefly to improvement of the main, through highways, a well justified course, but in the future, it was pointed out, more attention must be given to the improvement of secondary and feeder roads and of conditions where the main highways carry traffic into cities. With especial emphasis on safety, it was also stated that at the same time the main highways must be maintained and further improved to meet existing needs.

It is the view of Federal highway officials who are coordinating the survey work in the various states that a selection should be made of those roads which, by reason of their importance, merit inclusion in an improvement program. Programs of the future, it is contended, can be intelligently planned only with information as to those roads that should be improved, construction costs, maintenance costs, amount of taxes that can be properly imposed for highway use and where the taxes should be imposed from the viewpoint of highway usage. Decisions along these lines are to be reached through information being collected and to be collected from each state survey, which has three branches, a highway conditon, a highway traffic and a highway finance survey.

Viewing highway transportation as one of the major industries of the countries, the purpose is to bring about its orderly development for a period of years on a basis of economic and social conditions.

Survey work now is under way in the following states: Washington, Oregon, Nevada, Idaho, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico, Nebraska, Kansas, Oklahoma, Minnesota, Iowa, Missouri, Arkansas, Louisiana, Wisconsin, Illinois, Michigan, Indiana, Ohio, Pennsylvania, Florida, North Dakota, Virginia.

Work will begin in the near future in California, South Dakota, Texas, Alabama, West Virginia and Tennessee, while Kentucky, North Carolina and South Carolina have indicated a desire to conduct surveys.

CIT Safety Foundation Plans Good Driver Meeting in N.Y.

Plans for the first nation-wide motorcade of safe drivers, to converge upon New York City, Aug. 31, were announced this week by the C.I.T. Safety Foundation, and the American Automobile Association. After the safe driver delegates from all States in the union arrive in New York, they will conduct a unique two-day "accident clinic" for the diagnosis of driver habits and driver evils.

The delegates will not only relate their experiences and observations during the cross-country pilgrimage, but will give their own opinions on the causes of automobile accidents, and advance their ideas for the most practicable "cures."

The selection of the delegates from each of the 48 States and the District of Columbia will be under the direction of the American Automobile Association and affiliated State motorist organizations. The A.A.A. will also fix rules and regulations, and lend its support in every way to the first National Safe Driver Motorcade. One delegate will be chosen to represent each State. The delegates will drive their own cars which must be in good mechanical condition and will follow routes fixed by the A.A.A.

The methods of selecting the safe driver delegate may vary slightly, but the general conditions as laid down by the A.A.A. provide for the setting up of a board of judges in each State and the gathering of data on application blanks to permit a determination of who has the most outstanding record in safety and is most worthy of representing the State in the Motorcade and clinic.

Gar Wood to Sell Shares But Will Retain Control

Gar Wood Industries, Inc., has filed a registration statement providing for the sale of 320,000 shares of $3 par value common stock now held by its president, Garfield A. Wood. There are 800,000 shares outstanding of which Mr. Wood now owns 770,446. After completion of the sale he will retain 56.3 per cent of the stock.

Denominations of 6 and 12 Pfennigs, carrying the pictures of Daimler and Benz, are included in a recent stamp issue commemorating the 50th anniversary of the advent of the gasoline automobile in Germany.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES

General business activity last week was maintained close to the recent peak level for the current movement. Retail trade showed further gains, and it is expected that sales will be stimulated during the remainder of this month by the payment of the bonus. The drought in the eastern portion of the cotton belt has been relieved somewhat; but the rainfall has been spotty in character, and many localities are reported to be too dry.

Carloadings Continue to Gain

Railway freight loadings during the week ended June 6 amounted to 695,845 cars, which marks a gain of 48,986 cars above those during the preceding week, a rise of 66,133 cars above those a year ago, and an increase of 79,077 cars above those two years ago.

Food Slightly Cheaper

Retail food costs during the two weeks ended May 19 declined 0.3 per cent, according to the Bureau of Labor Statistics. The current index stands at 79.9, based on the 1923-25 average as 100, as against 80.1 two weeks earlier and 81.4 a year ago.

Department Stores Sell More

According to the Board of Governors of the Federal Reserve System, department store sales during May increased contrary to the usual seasonal movement. The current adjusted index stands at 88, as against 81 for April and an average of 82 for the first four months of this year.

Profits Rise 49%

Net profits of 254 industrial and mercantile concerns during the first quarter of this year were 49 per cent above those in the corresponding period last year, according to the Federal Reserve Bank of New York. However, profits were 26 per cent below those in the first quarter of 1930 and were below those in the corresponding period in 1929 by a considerably greater percentage.

Living Costs Lower

According to the Bureau of Labor Statistics, the cost of living in the United States declined by 0.8 per cent from January 15 to April 15. Although there were other slight declines, the fall is mostly the result of a reduction of 2.8 per cent in food costs.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended June 13 stood at 82.3, as against 81.2 for both the week and two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended June 10 showed a decline of $1,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and government securities remained unchanged. Money in circulation declined $16,000,000, and the monetary gold stock increased $71,000,000.

Chevrolet Economy Tests Under Way in 12 Cities

A test of delivery trucks, under the supervision of the American Automobile Association, is now under way in 12 cities of the United States, in each of which a leading department store is operating a Chevrolet test truck in actual service. It is the first test of this sort ever to have been sanctioned by the A.A.A., and so far as is known, the first test of a group of identical trucks operating under varied conditions in different cities.

The operation covers a period of 30 working days, during which accurate records will be kept covering the economy of the trucks in fuel and oil and in other expenses, accompanied by an exact record of the performance of the trucks in the handling of department store deliveries.

Capital Increase Voted by Automotive Equipment, Inc.

At a stockholders' meeting of Automotive Equipment, Inc., New York, an increase in the amount of authorized capital was approved and the following directors elected: Howard E. Coffin, chairman, formerly vice-president of Hudson and president chairman of National Air Transport; C. Townsend Ludington, organizer and formerly president of Ludington Air Lines, director of National Air Transport and manufacturer of autogyro planes; William F. Jetter, formerly treasurer of the Superheater Co. and general manager of the Pneumatic Scale Co. of Boston; C. S. Sale, member of the firm of Sale, Ashman and Benedict, Inc., New York, industrial engineers and formerly president of the American Car and Foundry Motors Co., and O. H. Simonds, formerly public utility executive with Electric Bond and Share and Appalachian Gas Corp.

The new officers of Automotive Equipment are: C. S. Sale, president; L. J. Buckland, vice-president; O. H. Simonds, treasurer, and C. Franklin Hennecke, secretary. The company manufactures in its plant at Long Island City windshield cleaners and other automotive devices, and the new organization plans an increase in plant facilities.

Canadian Imports of Cars Were $818,000 in April

Imports of automobiles into Canada in April more than doubled in value compared with April, 1935. The imports were worth $818,000 against $338,000 in the corresponding month last year.

There were 1084 automobiles from the United States worth $778,000 and 79 from the United Kingdom valued at $40,000. Automobile parts from the United States amounted to $2,197,000 and from the United Kingdom $20,000. There were 2702 bicycles imported from the United Kingdom, and 66 from the United States, while 51 motorcycles were imported from the United Kingdom, 66 from the United States and one from Germany.

British Cars to Canada

Morris Industries Export Limited, Oxford, England, is sending a shipment of Morris 8 cars, to be on sale in the Vancouver, B. C., market during the month of June. Distributors in British Columbia are incorporated as Oxford Motors Limited, 1147 Howe Street, Vancouver, B. C.

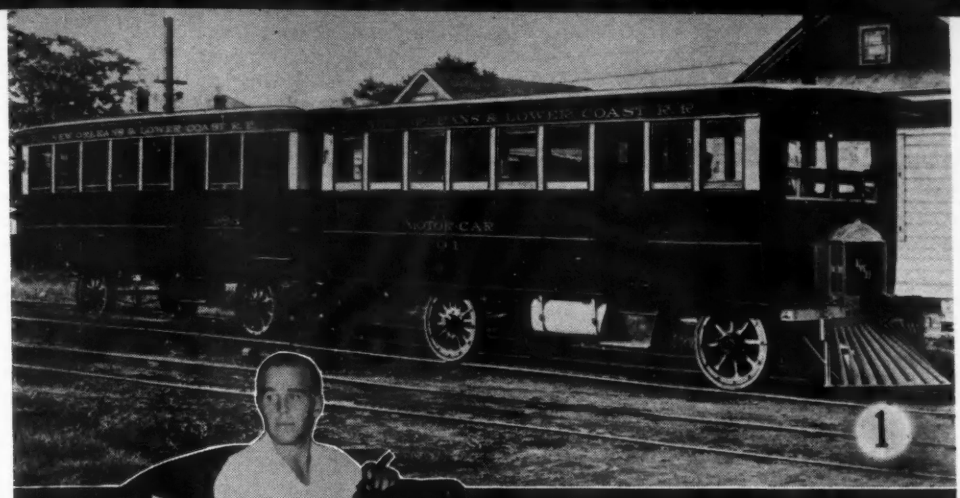
40 Years Ago

with the ancestors of AUTOMOTIVE INDUSTRIES

The Hyatt Roller Bearing Co. have removed their New York office to the Havemeyer Building, 26 Cortlandt Street, where they will be pleased to meet customers, both old and new.

J. Frank Duryea, mechanical superintendent of the Duryea Motor Wagon Co., Springfield, Mass., sailed for Europe June 14, taking with him the wagon which won first prize in the *Cosmopolitan* race. He will spend about two weeks in London and Paris investigating the foreign market and exhibiting the Duryea wagon.—From *The Horseless Age*, June, 1896.

The WORLD on WHEELS



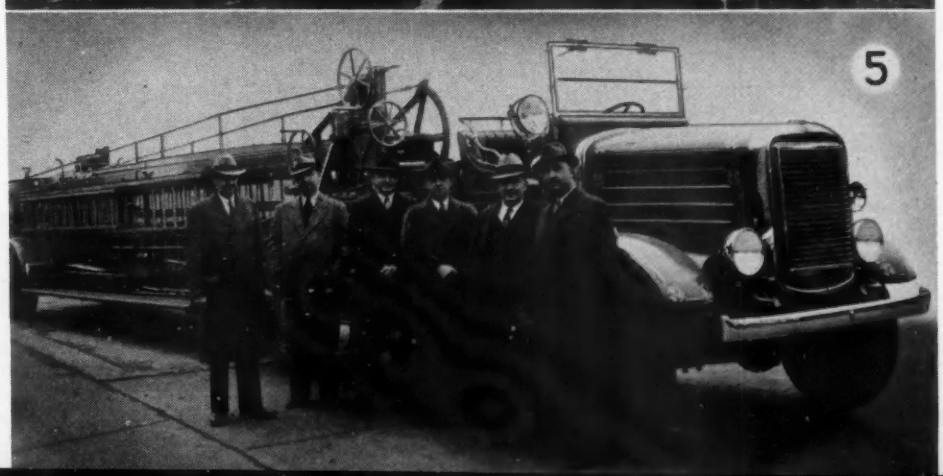
N. O. & L. C. R. R. Co., European and News of Hawaii photos.

1. This forerunner of modern motor-rail passenger coaches was built in the shops of the New Orleans & Lower Coast Railroad in 1919 and was operated until 1926.

2. A. P. Humphries, New York sportsman, won the "Millionaire's Derby" midget automobile race in Honolulu recently, competing against Dan Topping, Ben Finney, both of New York, and Arturo Ramos, of the Argentine.

3. The first car to operate over the San Francisco-Oakland bridge, rapidly nearing completion, was this light bus used to carry workmen over the structure.

4. The 1.7 liter Adler-Trumpf filling up for its record-breaking runs on the new motor highway near Frankfurt a/M., Germany.



5. Mayor Daniel W. Hoan, of Milwaukee (left), with a group of fire department officials from his city, looks over some of New York City's newest fire equipment.

A new catalog on Redler Conveyors and Elevators* just published by the Stephens-Adamson Mfg. Co., Aurora, Ill., is deserving of special attention for its completeness in covering practically every detail of **conveyor handling.**

Eastern Machine Screw Corp.'s Style TM **Insert Chaser Die Head for cutting taper threads** is completely described in a pamphlet* recently issued by the company.

"Tractor Farming," International Harvester's periodic house organ "devoted exclusively to **farming with tractors**" (but occasionally getting in a word about trucks) is worthy of note for its timely interest which even includes pages for the wife and children. If you'd like to be placed on the list, drop us a line.

Welding and cutting high chromium steels is the subject of an informative booklet* recently announced by the Linde Air Products Co., New York. Much scientific data on welding results as well as procedure is contained within its pages.

Victor Gasket Guide No. 11,* recently issued, has 396 pages of **gasket information** covering every American car and truck. This year there's a handsome photograph section added.

* Available from AUTOMOTIVE INDUSTRIES.

Bonus Buying Begins

(Continued from page 857)

April despite the fact that both of these months set records for the past several years.

Pontiac deliveries for the first 10 days of June totaled 6101 units compared with 6054 units during the first 10 days of May and 4312 units during the corresponding period a year ago.

Sterling Motor Truck Co. reports a 32 per cent increase in business so far this year and May sales the largest of any month since 1931.

During the first 10 days of June, Studebaker dealers in the U. S. delivered 2293 units compared with a total production at the factory for the period of 2190 units. Last year during the same period, factory production totaled 999 units indicating an upturn this year of 119 per cent.

During the first 10 days of this month domestic sales of 1936 Buick models amounted to 4768, a total not exceeded in a similar period since 1928. Deliveries during the 10 days represent a gain of 157.5 per cent over the 1846 cars delivered in corresponding period last year. The goal set for the next two-month drive is in keeping with increased sales enjoyed by the company this year and Buick officials are confident it will be attained and probably surpassed.

May sales of the Detroit Forging Co. totaled $77,203, representing an increase of 50 per cent over the same month in 1935, while total sales this year to date amounted to $336,609—an increase of 3.7 per cent.

All records were broken by Fry Products, Inc., when seat cover shipments totaled $101,000 and aggregated a net income for the month of $8,736.

The wheel division of Motor Wheel Corp. reports sales for the first five months this year 25 per cent ahead of the same period in 1935. April sales were 40 per cent better and while demand has begun to ease up for the usual seasonal decline, business is still well ahead of last year.

New Douglas Transport Delivered to American

The first of the new Douglas sleeper transport planes has been delivered to the American Airlines and will be placed in service together with two sister ships on June 25.

Fitted with upper and lower berths and one stateroom, the new ship accommodates fourteen passengers. Although it weighs 12 tons compared with 9 for the DC-2 transport, its 97-ft. wingspread is only ten more than the older type. Power is supplied by two Wright Cyclone 1000 hp. engines furnishing a top speed of 217 m.p.h. and a cruising speed of 190 m.p.h. Its gasoline consumption of approximately 88 gal. per hr. is said to be less than the smaller type planes owing to the new exhaust analyzer and mixture controls.

Like the DC-2 the new plane takes off and lands at approximately 70 m.p.h. but stopping distance has been decreased by the use of more powerful brakes.

May Machine Tool Sales Take Unexpected Decline

Total orders for machine tools during May sagged about five per cent below the April figure but remained approximately 47 per cent ahead of the 1935 figure, according to estimates of the National Machine Tool Builders Association. Earlier indications had pointed to an upturn, but the expected retooling for new models is not yet underway.

Foreign business accounted for 19 per cent of the May business compared with 12 per cent in April.

Detroit Engineering Society Gets Income of Rackham Fund

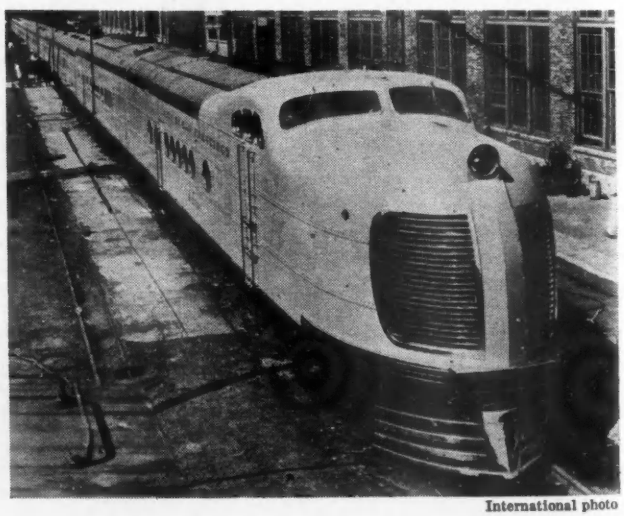
Articles of incorporation of the Rackham Engineering Foundation were filed in the offices of the Michigan Corporation and Securities Commission by Standish Backus, Alex Dow, Edsel B. Ford, Bryson D. Horton and William S. Knudsen, who are trustees of the corporation appointed for life. The new corporation will have title to the $500,000 endowment created by the Horace H. Rackham and Mary A. Rackham fund for the benefit of the engineering professions and allied arts and sciences in the Detroit area, and for the assistance of the public in meeting engineering problems. Under the plan adopted, the net income from the endowment will be paid to the Engineering Society of Detroit, Incorporated, April 15, 1936.

The directors of the Engineering Society are John H. Hunt, president; Harold S. Ellington, first vice-president; James W. Parker, second vice-president; Clair W. Ditchy, secretary; Ellsworth J. Burdick, treasurer; William D. Cameron, Martin R. Fisher, Clyde R. Paton and David Segal. John W. Kennedy was appointed assistant treasurer and Ernest L. Brandt, managing secretary.

The Rackham Engineering Foundation will have a discretionary right to permit a portion of the endowment to be used to provide a permanent headquarters for the Engineering Society of Detroit. Temporarily the headquarters of the society and foundation will be at the Hotel Statler in Detroit.

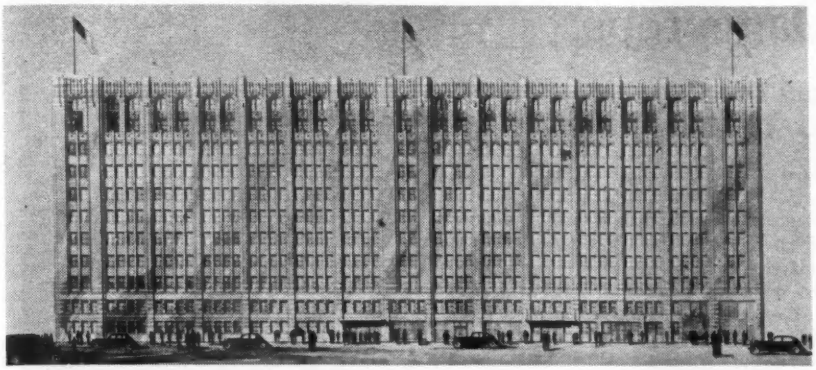
Geschelin to Speak at Rockford

Joseph Geschelin, Detroit editor, Chilton publications, will address the Rockford Associates, a group of machine tool builders and automotive producers in the vicinity of Rockford, Ill., on June 22, at a special banquet meeting. The subject will be a discussion of future automobile design with special reference to 1937 models and production changes now under way.



The "City of San Francisco," eleven-car Diesel-powered train will soon go into service between Chicago and the Pacific Coast on a schedule of 39¾ hours, cutting 19 hours from the best time now made over the route by steam trains. The train is 714 ft. long and weighs 502 tons.

International photo



Architect's drawing shows how the General Motors Research Laboratories building in Detroit will look when the $1,000,000 addition, 180 ft. long, is added to the present structure.

Motor Payrolls 25% Higher On May 15 than Last Year

Seventy-one automobile plants in Michigan had 272,481 employees on May 15, an increase of 1.8 per cent over the number employed on April 15, and 1.2 per cent over May 15 last year, according to the monthly survey of the State Department of Labor and Industry. Amount of weekly payrolls however were up 2.1 per cent over corresponding April date and 25.7 per cent over the same date a year ago. Fifty-eight automotive parts plants with 25,607 employed showed increase of 1.5 per cent over April and 3.4 per cent compared with a year ago. Amount of their payrolls was off 0.6 per cent from the preceding month but were up 28.7 per cent compared with May 15 last year.

Robert Jardine

Robert Jardine, chief engineer of the Wilcox-Rich Corp., and for many years a prominent figure in the automotive world, died suddenly last week on board a steamer arriving in Cleveland. Death was attributed to heart failure.

Mr. Jardine was 58 years old. He entered the automotive industry in 1899 as chief engineer for a French automobile manufacturer, and returned to this country in 1903. He was responsible for many developments, particularly in the valve field. In point of service, he was one of the oldest men in the industry in this country.

Mr. Jardine was a member of the Society of Automotive Engineers, the Detroit Athletic Club and the Detroit Yacht Club. His widow and a son, Robert, survive.

Murray Gets Contract For Plymouth Frames

Murray Corp. of America is understood to have secured a contract for manufacture of a substantial portion of Plymouth's 1937 frame requirements.

The company is planning to spend approximately $350,000 for expansion of its frame plant in order to handle the Plymouth business. At present Murray is making Dodge commercial car frames, Ford truck and part of Ford passenger car frames. The new equipment required for the Plymouth contract must be ready for operation Oct. 1.

Murray will also make a line of convertible sedans for both Plymouth and Dodge next year. This is the first body business Murray has had from Chrysler divisions in several years.

U. S. Plants Not Barred in Japan

(Continued from page 858)

Japanese subjects or Japanese juridical persons.

4. When such a company imports machines and materials necessary for the industry and obtains government permission, it shall be exempted from import duties.

5. Such a company may float debentures to a total in excess of the maximum set in the commercial code.

6. When the government recognizes that imports of automobiles or parts threaten to menace the consolidation of the automobile manufacturing industry in Japan, it may restrict such imports or impose a maximum tariff of 50 per cent ad valorem.

7. The government is authorized to issue instructions to licensed companies concerning supervision in military affairs.

8. Any company which commenced automobile manufacturing before Aug. 9, 1935, when the government announced its new policy, may continue to do so on the scale of its operations on or before that date.

Both General Motors and Ford have assembly operations in Japan, and it was at first feared that the new law would interfere seriously with their operations, obliging them either to sell out a majority interest to Japanese subjects, or to remove their plants. It now appears that these companies will not be subject to the new law, for the time being, at least, and as long as they do not manufacture more cars than was the case on last Aug. 9 or earlier.

Registrations of motor vehicles in Japan on Jan. 1, 1936, according to figures just received by the Department of Commerce, amounted to 133,200, of which 59,700 were passenger cars, 26,600 buses and 49,800 trucks. Ninety-two per cent of the passenger cars, 89 per cent of the buses and 87 per cent of the trucks were of American brands, built either in the United States or in Japanese assembly plants.

Truck Output Near Quarter Million

First 4 Months Gained 14% Over 1935; Passenger Cars Up Most in $750-$1000 Price Class

U. S. Passenger Car Production for Domestic Market by Wholesale Price Classes

First four months 1936 and 1935 compared

	1936	1935	Per Cent Change	Per Cent of Total 1936	Per Cent of Total 1935
$500 and under	664,109	705,454	— 5.8	55.16	60.24
$501-$750	477,547	428,492	+11.5	39.65	36.59
$751-$1,000	43,715	23,529	+86.0	3.63	2.01
$1,001-$1,500	13,827	7,981	+73.0	1.15	.68
$1,501-$2,000	3,103	2,825	+10.0	.26	.24
$2,001-$3,000	1,638	1,646	— 0.4	.14	.14
$3,001 and over	130	1,135	—88.0	.01	.10
Total	1,204,069	1,171,062	+ 3.0	100.00	100.00

U. S. Truck Production by Capacities for U. S. Domestic Market

First four months 1936 and 1935 compared

	1936	1935	Per Cent Change	Per Cent of Total 1936	Per Cent of Total 1935
1½ tons and less	233,045	204,401	+14.1	94.85	94.85
2 to 3 tons	8,809	8,332	+ 5.8	3.59	3.87
3½ tons and over	2,427	1,960	+23.9	.99	.91
Special and buses	1,415	803	+76.2	.57	.37
Total	245,696	215,496	+14.0	100.00	100.00

Due to a revision of Canadian production data for 1935 it was impossible to furnish complete reports on U. S. and Canadian production. Complete reports will be published as soon as the revised data are available.

New Cars More Dangerous?

Small Scale Survey Indicates Old Cars Are Responsible for Fewer Accidents

By Don Blanchard

That old cars are a menace to the safety of other users of the highways has frequently been emphasized in both the press and from the public platform. Moreover, safety has been one of the main reasons advanced for junking plans which factories have put into effect from time to time to help dealers clear their stocks of aged used cars.

However, because this assumption seemed so obviously reasonable, so far as we know, no attempt has been made heretofore to find out just how true it is. Recently *Automobile Trade Journal** made a small-scale survey of the facts, emphasizing that the number of accidents included in the survey is too small to prove anything.

The results obtained in the small-scale survey suggest that the relationship between age and accidents is exactly the opposite of what has been widely assumed. In other words, in proportion to the numbers of newer and older on the road, newer cars are involved in relatively more accidents than are older ones.

The figures on which this observation is based are the result of an analysis of 494 reports of accidents involving damage of $50 or more, taken at random from the files of a large eastern state for the months of November and December, 1935, and January, 1936. The age of the car involved in each of these accidents was determined and the accidents then classified according to the ages of the cars involved. Then an estimate was made of the percentage of cars of each year of manufacture back to 1924 which were in service at the end of last year. This estimate was based

(Turn to page 883, please)

* Published by the Chilton Co., publishers of AUTOMOTIVE INDUSTRIES.

Tire Union Organizers Launch Campaigns in Branch Factories

Plans of major Akron tire manufacturers to decentralize the tire industry by transferring production equipment from Akron to their subsidiary factories, have been countered by the United Rubberworkers Union of America with announcement from its executive headquarters in Akron that it will launch a campaign to raise $100,000 among present members for the purpose of organizing rubber workers in all cities where Akron firms have branch plants. Goodyear Tire & Rubber Co., has a branch factory at Gadsden, Ala., where it has doubled production and is now turning out 8000 tires a day, and also has large branch plants at Cumberland, Md., and Los Angeles. Firestone and Goodrich have Los Angeles factories, all three Pacific Coast factories having recently increased production substantially as the result of the labor strife in Akron.

Union officials indicate their first organization effort will be in Gadsden where their president, Sherman H. Dalrymple claims to have been attacked by non-union rubber workers during a recent union rally there. Federal officials, upon plea of the union, are now investigating the alleged assault upon Dalrymple.

Meanwhile Akron tire manufacturers continue to push production to meet the current demand of retail marketers and car manufacturers. Production in the Akron district, when not interrupted by union sit-down strikes, is averaging better than 110,000 tires per day. Goodyear unionists staged a 24-hour sit-down strike recently in protest against the alleged Gadsden attack on Dalrymple. As the plant prepared to resume operations the next midnight, the skies near Goodyear were lighted by the flames of three burning crosses, and the unionists immediately staged another 5-hour sit-down.

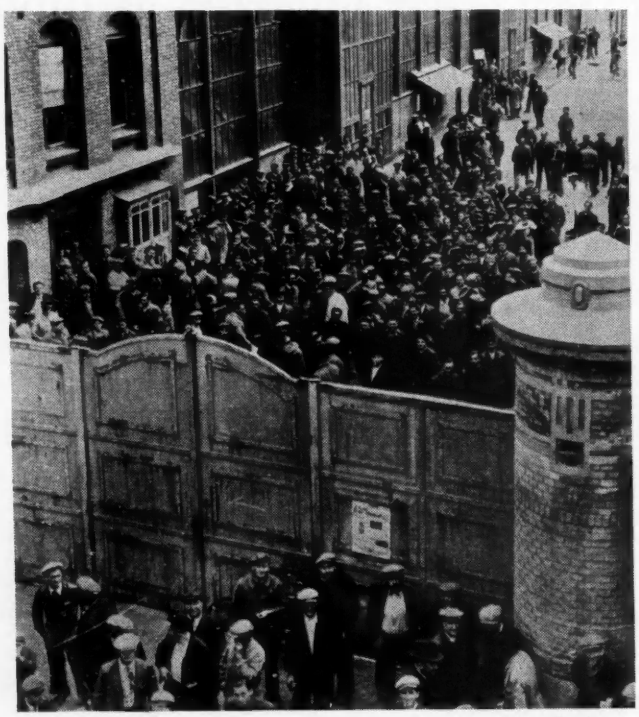
A complete walk-out of 1100 Seiberling Rubber Co., employees, scheduled for June 15, was averted by negotiation and Seiberling plant operations are continuing at normal pace.

L. R. Buckendale

Buckendale Named Engineering Vice-President of Timken-Detroit

L. R. Buckendale has been elected vice-president in charge of engineering of the Timken Detroit Axle Co. Mr. Buckendale has been executive engineer of the company for a number of years.

Walter F. Rockwell has been elected secretary and A. I. Hawkins treasurer of the company, succeeding W. C. Wood, former secretary-treasurer, resigned. Mr. Rockwell is also a vice-president of the company and Mr. Hawkins was formerly assistant to the vice-president.



International Photo

The courtyard of the Farman airplane works in Paris was filled with idle workmen when the "sit-down" strikes involving more than a hundred thousand workers tied up French industry early this month. The strikes, which were remarkably free of violence, ended when the new Blum government promised to push legislation granting the workers' demand—two weeks' paid vacations annually and the 40-hour week without reduction of pay.

Automotive Metal Markets

Remarkably High Steel Production Rates Maintained by Plants Working for Motor Requirements

By William Crawford Hirsch

Steel takings by automotive consumers continue to support a high rate of finishing mill operations. Detroit district mills are running at capacity and those in other steel-making areas that cater primarily to automobile manufacturers and parts makers are also working at impressively high rates.

Steel market analysts, striving to reconcile this condition with the widely publicized policy of no stocking of steel by automotive buyers in the face of the $2 per ton price advance on July 1, are more or less puzzled. What is taking place in the case of many steel products is liberal specifying, rather than out-and-out stocking.

There is, however, a certain amount of stocking going on in such descriptions of steel as can be conveniently stored, and an order for a round tonnage of axle steel by one of the large automobile manufacturers came in for wide mention in this connection this week. Then there is much indirect stocking. Heavy tonnages of hot rolled strip steel have been contracted for at second quarter prices to be cold rolled later.

Much of this week's advance in the rate of employed ingot capacity to 70 per cent is due to stocking of semi-finished steel by non-integrated rolling mills, much of whose output eventually goes into automotive consumption. Some of the steel producers fear that automotive buyers may become over-exacting in the matter of finish of sheets and analyses of alloy steels when the flow of new model material to assembly plants gets under way.

Steel company sales managers look for very little buying of 1937 model material to make itself felt before the second half of the third quarter. The market's tone meanwhile will be considerably influenced by the support that comes to steel mills from other industries, many of which are still far from able to consume anything like their normal quotas.

Pig Iron—While some automotive foundries are taking in less iron, others continue to call for metal in accordance with fairly regu'ar melting schedules. Third quarter prices, unchanged from those in effect during the second quarter, have so far failed to stimulate much interest in forward buying.

Aluminum—Substitution of steel pistons for aluminum by one of the large automobile manufacturers has so far been without any effect on the market. Prices for both primary metal and the secondary grades rule steady and unchanged.

Copper—Consumers' holdings are thought to be growing lighter, but producers apparently do not yet deem the time opportune for launching another selling campaign through announcement of an advance in price following a period of grace. Producers' price is unchanged at 9½ cents, delivered.

Tin—Uncertainty over the future of restriction of output under control of the International Tin Committee caused the London market to decline more than $22 a ton on Monday, resulting in a dip of ⅞ cents per pound to 41⅛ cents in the New York price for spot Straits.

Lead—Sellers look for much July covering in the next few days. Prices are unchanged.

Zinc—Quiet and unchanged.

International Harvester Announces Promotions

The International Harvester Co. has announced three promotions as a result of the retirement of A. A. Jones, vice-president in charge of manufacturing.

C. R. McDonald, manager of manufacturing, was elected vice-president to succeed Jones; James M. Ballentine, works manager in charge of the implement group of factories, was appointed to succeed McDonald as manager of manufacturing, and C. H. Smart, works manager in charge of the automotive group, was appointed assistant to the vice-president in charge of manufacting.

A.S.T.M. Nominations

Nominations for officers of the American Society for Testing Materials for 1936-1937 are announced. Official notice of election will be given at the first session of the A.S.T.M. annual meeting, June 30, in Atlantic City.

A. C. Fieldner, chief engineer, Experiment Stations Division, U. S. Bureau of Mines, Washington, D. C., has been nominated for president and T. G. Delbridge, manager research and development department, the Atlantic Refining Co., Philadelphia, for vice-president. Nominations for members of the executive committee are: O. U. Cook, assistant manager department of metallurgy, inspection and research, Tennessee Coal, Iron and Railroad Co., Birmingham, Ala.; H. F. Gonnerman, manager research laboratory, Portland Cement Association, Chicago, Ill.; C. S. Reeve, manager research development, the Barret Co., Leonia, N. J.; F. E. Richart, research professor of engineering materials, University of Illinois, Urbana, Ill., and F. M. Waring, engineer of tests, the Pennsylvania Railroad Co., Altoona, Pa.

April Tire Shipments Were 27% Above March

Shipments of pneumatic casings during the month of April are estimated to be 4,902,721 units, an increase of 27.1 per cent above March although 4.7 per cent below shipments made in April, 1935, according to statistics of the Rubber Mfgrs. Association, Inc.

This organization estimates production of pneumatic casings for April to be 4,854,133 casings, an increase of 33.4 per cent over March 7.6 per cent above April, 1935.

Pneumatic casings in the hands of manufacturers, April 30, 1936, are estimated to be 9,034,017 units, a decrease of less than one per cent under the stocks on hand March 31, and 17.9 per cent below stocks on hand April 30, 1935.

Calendar of Coming Events

SHOWS

Olympia Motor Show, London, England, Oct. 15-24
National Motor Truck Show (N. J. Motor Truck Assn.), Newark, N. J., Nov. 3-7
National Automobile Show, Grand Central Palace, New York.....Nov. 11-18
International Aviation Show, Paris, France .....Nov. 13-29
Boston Automobile Show.....Nov. 14-21
Columbus Automobile Show ....Nov. 14-20
Chicago Automobile Show.....Nov. 14-21
Detroit Automobile Show.....Nov. 14-21
Washington, D. C., Automobile Show, Nov. 14-21
Cincinnati Automobile Show....Nov. 15-21
St. Louis Automobile Show.....Nov. 15-22
Baltimore Automobile Show....Nov. 21-28
Brooklyn Automobile Show.....Nov. 21-28*
Cleveland Automobile Show.....Nov. 21-28
Kansas City Automobile Show..Nov. 21-29*
Milwaukee Automobile Show....Nov. 22-29
Peoria Automobile Show...Nov. 30-Dec. 5*
Philadelphia Automobile Show, Nov. 30-Dec. 5*

* Tentative dates.

Natl. Exposition of Power & Mechanical Engineering, Biennial Meeting, New York City .....Nov. 30-Dec. 5
Automotive Service Industries Joint Show, Chicago .....Dec. 9-14

CONVENTIONS AND MEETINGS

National Oil and Gas Power Conference, American Society of Mechanical Engineers, University of Michigan, Ann Arbor .....June 24-27
American Society for Testing Materials, Annual Meeting, Atlantic City .....June 29-July 3
National Association Power Engineers, Annual Meeting, Chicago, Aug. 31-Sept. 4
American Transit Association, Convention, White Sulphur Springs, W. Va. .....Sept. 21-24
First Aircraft Production Meeting of the S. A. E., Los Angeles....Oct. 14-16
American Society for Metals, 18th Nat'l Congress, Cleveland, O. ....Oct. 19-23
American Gas Association, Annual Meeting, Atlantic City.....Oct. 26-31
American Petroleum Institute, Annual Meeting, Chicago .....Nov. 9-12
Natl. Industrial Traffic League, Annual Meeting, New York City.....Nov. 19-20

No Magic

could evolve the whole answer to the question, "What's going to happen to American transportation in the next decade?"

Each one of the contributing agencies is dependent to a greater or less extent on the other, as the picture suggests.

Important at the moment is the effect of two-cent rail fares on the automotive agencies. From a broad background, Riley E. Elgen, chairman of the Public Utility Commission of the District of Columbia, has reached closely-reasoned conclusions which should interest every automotive executive with an interest in the transportation problem.

Photomontage by Howard Kohlbrenner

Two-Cent Fares for Railroads

What Will They Do To Automotive Development?

By

Riley E. Elgen

THE effect of the activities of the unregulated motor vehicles upon the business of the highly regulated railroads has been a matter of great concern both to the railroads who previously enjoyed, nearly if not complete monopoly in the field of land transportation of men and goods, and the Interstate Commerce Commission, the regulatory realm of which was thus being invaded by an uncontrolled mass of competitors. The effect of the operation of motor vehicles on the passenger business of the railroads was particularly noticeable. Statistical data[1] below give the picture that confronted the Commission and the railroads when they met, in public hearing, in January, 1935, for the purpose of determining what could be done to stop the decline in passenger revenue, which the Commission said[2] was about equal to expenses in 1926. The different angles from which passenger business is viewed shows how startling had been its decline from 1926 to 1934:

	Per Cent
Passenger-train car-miles	33⅓
Passenger-train miles	34.8
Passengers	48.3
Passenger revenue	67.0
Amount of revenue received from each passenger.....	36.4
Amount of revenue received from each passenger for each mile he rode.....	34.7
Average distance traveled	2.4

Early in the history of public transportation by motor vehicle the Interstate Commerce Commission attributed loss of rail passengers to motor buses. The first official pronouncement[3] of that body concerning the effect of motor vehicles on railroad revenue was in 1922, in which case the Commission said:

> "Many causes contributed to the decrease in revenue passenger-miles (of the railroads) in 1921. They include the business depression. *The increased use of motor vehicles, the improvement of highways, and the high level of passenger fares.*" (Italics supplied.)

The inference to be drawn from that language is that to overcome decreases in passenger revenue it would be necessary to increase the volume of traffic by reducing the level of fares on railroads in order to regain and retain patronage lost to motor vehicles. This was done on June 2, this year.

Following up this reference, the Commission, on its own motion, entered upon an investigation on June 15, 1926, into the general question of the operation of motor buses and motor trucks. In its report[4], speaking of the development of railroads, it said:

> "Without such a transportation system the present industrial development could not have been attained. There was needed, however, some agency which would permit the fullest development of the country's economic situation by permitting transportation and communication to reach remote communities through territory not able to support costly railroad facilities. This need has been supplied by motor vehicle transportation, flexible and composed of small units, so that many remote communities are now served by such agencies and enjoy the benefits of practically direct rail service."

This quotation establishes the concept which the Commission has of the possibilities of motor transportation. It would appear, as conceived by it, that motor vehicles should be used in the main to supplement existing railroad facilities. This concept, formed from testimony taken in 1926 when motor transportation was in its infancy, has not been altered by the tremendous developments in the art since that first investigation.

That the Commission still adheres to its original views finds reflection in its recommendation in "Coordination of Motor Transportation,"[5] decided in April, 1932, which are almost identical with its conclusions in its report on "Motor Bus and Motor Truck Operation,"[6] referred to above, the investigation of which began in June, 1926, and which was decided in April, 1928. In fact, the Commission said[7], in reference to those prior conclusions:

> ". . . we made certain recommendations for legislation, specifically those recommendations which we renew in original or modified form are . . ."

Those conclusions were the foundation stones of the Motor Carrier Act of 1935, by which the Commission was given a greater measure of control over motor vehicle operation than it then had over railroads. When the operation of these motor vehicles was placed under the guardianship of the Commission it was the expressed hope of those hitherto orphans of federal regulation that their condition would be improved and that they would not be accorded such treatment as step-children are sometimes made to suffer. However, regulations already promulgated by the Commission as a result of authority granted by the Motor Carrier Act will have the effect eventually of eliminating most small independent operators where they are or may be in competition with other larger and more prosperous operators or the railroads. These regulations will tend to retard, if not indefinitely delay, those natural benefits which the Commission recognized in its 1928 report on "Motor Bus and Motor Truck Operations,"[7] when it said, referring to the motor vehicle, that:

> "There was needed, however, some agency which would permit the fullest development of the country's economic situation by

[1] Compiled from I.C.C. statistics.
[2] 214 I.C.C. 174, 179.
[3] Reduced Fares, 68 I.C.C. 676,728.
[4] 140 I.C.C. 696.
[5] 182 I.C.C. 385-388.
[6] 140 I.C.C. 696.
[7] 140 I.C.C. 696.

permitting transportation and communication to reach remote communities . . ."

Why and how this need will be defeated is plain to see when it is known that according to testimony introduced at hearings conducted before the Senate Committee on Interstate Commerce in connection with the Motor Carrier Act, Feb. 26 to March 6, 1935, it was shown that about 82 per cent of all for hire motor vehicles (now subjected to Interstate Commerce Commission regulation) were operated by the owner or by one or two employees. The failure of such operators to comply with its regulations will have to be "winked at" by the Commission, otherwise they will be driven from the field of transportation. In other words, this newborn child of regulation will be smothered to death with a blanket of regulations by its own mother.

The enforcement of the proposed requirements of financial responsibility upon the part of small operators, according to standards of the large and prosperous operators and the railroads, in themselves will destroy most of them. The requirement of a showing of convenience and necessity will prohibit extensions of the operations conducted by small concerns where large operators oppose their applications. The requirement of keeping their accounts according to a uniform system prescribed by the Commission, and the making of frequent reports to it, will make it necessary for small operators to have accountants, lawyers and experts who are versed in the lore of regulation, for which they can ill afford to pay. Certainly the one, two and three-man operations, if they comply with those requirements, will be somewhat discouraged if not entirely eliminated. There is no doubt that regulations such as these will tend to accomplish the purpose expressed by a witness favoring the Motor Carrier Act, who said:

"This system of transportation must be in the hands of reliable and responsible operators. . . ."

Of course, it is quite right and certainly proper that the great trunk line rail systems should continue to be maintained in the public interest, only, however, until some method of transportation equally as reliable has been developed and has met the test of efficiency, economy and ability to serve the nation adequately. That some measure of Federal regulation was needed to bridge the gap of state regulation, for interestate motor carriers, cannot be questioned. However, such regulation should be constructive and not destructive. The greatest possible latitude should be permitted in the development of the art of motor vehicle transportation so that the country be not deprived of that which comes only from experience. Benefits accruing to the people through scientific investigations and inventions of proven worth and value should not be shelved or discouraged by public regulations. It may be possible that a perfectly meshed, planned and coordinated national system of transportation such as contemplated by the Motor Carrier Act might be the means of lowering the distribution costs of useful products. However, that remains to be demonstrated. Those who advocate the principle do not predict such results. In fact, they admit that transportation costs to the public will thus be raised. Certainly the mere meshing, planning, and coordinating of the services of railroad, motor, and water carriers, and air transport, will not necessarily achieve that end.

Thus it will be seen that through a sequence of events beginning with the observation of the Commission in 1922[6], in which they attributed loss of passenger revenue, in part, to:

" . . . increased use of motor vehicles and improved highways . . . ,"

in their conclusions in the 1926 investigation[9] of the uses of motor buses and motortrucks intransportation, and in their recommendations[10] (1932) concerning legislation needed to control the operation of motor vehicles in interstate commerce; that the Motor Carrier Act of 1935 was the ultimate aim from the beginning of the decline in railroad passenger, and later freight, revenue. Insofar as passenger revenue is concerned, the Commission took the position[10] in 1932, that:

"It is admitted by all, we presume, that most traffic now moving by motor vehicle would, in the absence of the motor vehicle, be moved by rail if it moved at all."

Of course, the converse is equally true.

[8] Reduced Railroad Rates, 68 I.C.C. 676.
[9] 140 I.C.C. 696.
[10] 182 I.C.C. 273, 385.

These Men Control the Destiny of American Transportation

Photo by Underwood & Underwood

The most recent photograph of members of the Interstate Commerce Commission, which in a recent 5 to 4 decision levelled all railroad fares in the U. S. to a basis of two-cents per mile for coach travel and three-cents per mile for Pullman travel.

Left to right, front row, Joseph B. Eastman, Balthasar H. Meyer, Charles D. Mahaffie, Clyde B. Aitchison and Frank McManamy.

Rear, standing, Walter M. W. Splawn, Hugh M. Tate, (Chairman) Claude R. Porter, William E. Lee, Carroll Miller and Marion M. Caskie.

Decision on Passenger Fares

The Commission, in a divided opinion (5 to 4), on Feb. 28, 1936, ordered, among other things, the rail carriers to reduce the then existing maximum one-way fare in coaches from 3.6 to 2 cents per mile; to reduce the then existing first-class fare in parlor and pullman cars from 3.6 to 3 cents per mile; and to eliminate the pullman surcharge. These new maximum fares were not to be exceeded for one-way and round-trip travel. The Commission also found that the Southern District experimen-

Table A—Comparison of Railroad and Bus Transportation

Year	Auto Registration (Thousands) (1)	RAILROADS Average Haul per Passenger (Millions) (2)	RAILROADS Passenger Revenue (Millions) $ (2)	RAILROADS Passengers Carried (Millions) (2)	INTERCITY BUS Passenger Revenue (Millions) $ (3)	INTERCITY BUS Passengers Carried (Millions) (3)	TOTAL Railroad and Bus Passengers (Millions) (4)
1920	8,226	37.9	1,228.5	1,234.9	Not Available		.....
1921	9,346	36.0	1,153.8	1,035.5	"	"	.....
1922	10,863	36.7	1,075.9	967.4	"	"	.....
1923	13,480	38.5	1,147.6	986.9	"	"	.....
1924	15,461	38.7	1,076.5	932.7	"	"	.....
1925	17,496	40.5	1,057.7	888.3	"	"	.....
1926	19,237	41.1	1,043.1	862.4	205.0	377.0	1,239.4
1927	20,219	40.6	976.2	829.9	227.0	403.0	1,232.9
1928	21,379	40.0	902.3	790.3	255.0	449.0	1,219.3
1929	23,122	39.8	873.6	780.5	285.0	497.0	1,297.5
1930	23,059	38.1	729.5	703.6	205.0	428.0	1,131.6
1931	22,366	36.7	551.0	596.4	191.0	395.0	991.4
1932	20,885	35.4	377.1	478.8	185.0	357.0	835.8
1933	20,616	37.8	329.3	433.0	176.6	328.8	761.8
1934	21,524	40.1	346.3	449.8	171.2	378.2	828.0
1935	22,590	41.4	357.5	446.0	239.95	652.0	1,098.0

(1) From "Automobile Facts and Figures" except 1935, which was secured American Automobile Association.
(2) From Interstate Commerce Commission Statistics except 1935 which were secured from Association of American Railways.
(3) From National Association of Motor Bus Operators.
(4) Computed.

tal fares of 1½ cents per mile in coaches and 3 cents per mile in pullmans and the experimental fares in the Western District of 2 cents per mile in coaches and 3 cents per mile in pullmans were neither unreasonable nor unlawful.

The Attitude of the Carriers

There was not unanimity of opinion among the carriers in the different sections of the country, nor was there complete harmony among them in either the Southern, Western or Eastern Districts, as to what the Interstate Commerce Commission should do. The Pullman Company's representatives were not in accord with the carriers nor with the report of the Examiner which was later adopted by the Commission.

The Atlantic Coast Line and the Norfolk and Western were opposing the views of all other Southern carriers; the Chicago, North Shore and Milwaukee was not in accord with the other other Western roads; and the Baltimore and Ohio was out of tune with others in the East.

Experiments conducted by the Southern Railway for the purpose of determining the fare which could be charged in coaches and, at the same time, yield an increased revenue to the company, was the keystone of the reasoning back of the fare structure adopted by the Commission. These experiments began back in 1927 and continued in various forms and rates per mile up to September, 1932.

The Importance of Eastern Passenger Business

The opposition to a reduction in passenger rates by all save one of the big Eastern carriers lies in the greater relative importance of their passenger revenue. The Pennsylvania, New York Central, New Haven, Atlantic Coast Line and Long Island Railroads are, in particular, opposed to the cut in passenger fare. These, among others, have sought to enjoin the Commission's order in the Federal District Court of New York.

The tabulation below, compiled from statistics published in *Railway Age* for January and February of this year,

Railroads	Per Cent of Revenue Derived from Passenger Business
Long Island Railroad	69.4
New Haven	32.7
New York Central...	19.5
Atlantic Coast Line..	19.3
Pennsylvania Lines..	18.7
Southern Railway ..	10.5
Baltimore & Ohio....	7.2
84 Carriers	4.2

shows that 84 carriers, with one-third of the mileage (83,000) in this country, derived only 4.2 per cent of their revenues from their passenger business. On the other hand, the Eastern carriers (including the Coast Line), with only about one-eighth of the mileage, as reported, derived 21.5 per cent of their revenue from hauling passengers. Their aggregate revenue from that source was four times that of the 84 roads referred to, although their total revenue from all sources was only 43 per cent of the combined revenue of that group of roads.

The Southern Railway System, with 10.6 per cent, and the Baltimore and Ohio, with 7.2 per cent of their revenue derived from passenger service, could better afford to take a chance on getting increased earnings from reduced fares than could the Long Island, with 69.4 per cent of its revenue (in January) derived from that source, or the New Haven, with 32.7 per cent of its total earnings coming from its passenger business.

Another rather strong opponent to the reduction in rates was the Chicago, North Shore and Milwaukee, with its passenger business representing 78 per cent of its total revenue. Its principal competitors are the Milwaukee (C. M. St. P. & P.), with 6.5 per cent, and the Northwestern (C. & N. W.), with 12.5 per cent from hauling passengers. None of the 84 carriers included in the study below have passenger revenues in excess of 7 per cent of its total revenues.

Upturn in Both Freight and Passenger Revenue in 1936

According to *Railway Age* of April 25, the aggregate revenues for the two months of January and February of this year were $486,394,698 from freight and $66,004,331 from passenger service. Of the total freight and passenger revenues, 46.0 per cent was from the Eastern District, 20.1 per cent from the Southern District, and 33.9 per cent from the Western District. In the East passenger revenue was 14.9 per cent of its total revenue and in the South and West it was about 9.5 per cent in each instance. The Eastern District accounts for 57.6 per cent of all passenger revenue, the South 15.7 per cent, and the West 26.7 per cent, indicating the importance of this subject in the East.

The most significant figures, however, are the comparison of freight and passenger revenues for these two months of 1936 with similar figures for the same months of 1935. Such a comparison shows that freight revenue increased at about the same ratio in the South and West: 18.5 per cent for freight and 18 per cent for passenger revenue in the South, 17.7 per cent for freight and 19.7 per cent for passenger revenue in the West. The increase in freight revenue in the East was 14.4 per cent and for passenger revenue 11.2 per cent.

These figures would seem, in part, to lend validity to the argument of the Eastern carriers to the effect that the increases in passenger revenues in both the South and West was largely due to a general upturn in their business rather than to reduced fares. In fact, increases in Southern passenger revenue was not quite as great as that of freight, this tendency being more noticeable in the East. While in the West the passenger revenue advanced more rapidly than freight. The East made the poorest showing in per cent of increase for both freight and passenger revenue, with the latter lagging noticeably. Those who advocate reduced passenger fares to stimulate Eastern trade may find some comfort in the figures for the Western District, but not much in the South. They will, no doubt, attribute the lag in Eastern passenger revenues to high basic fares. This may or may not be the answer to the puzzle.

Movement of Passengers from the Rails

Turning now to the picture of the 1929-1933 losses of passenger travel by rail, let us see what happens when the passengers of the intercity buses are compared with those of the rails. Table A will aid materially in visualizing some of the movements discussed.

The rails carried about 1,235,000,000 passengers in 1920. This declined to 781,000,000 in 1929, a loss of 454,000,000. In that year the buses carried 497,000,000 passengers, which would seem to account for the entire losses of the rails; however, in 1933 the rails carried 433,000,000 passengers and the buses 329,000,000. From this it will be seen that the combined number carried by both transportation agencies was less by 19,000,000 than those carried (1929) by the rails alone, so it could not have been the buses which caused the losses of passengers on the rails, particularly as the bus passengers declined about 38 per cent, while the rails lost 45 per cent of their patronage, and travel by private auto declined 8 per cent. As all three agencies lost passengers it seems obvious that the same number of people were not traveling. In reviewing the patronage of buses and railroad cars during the depression it is seen that the combined number using both of these agencies in 1931 was about the same as those using railroads along in 1923. In each of the three years 1931-1933, the combined depression patronage of rail and bus was less than the railroad patronage during three of the most prosperous years (1924-1926) in the nation's history.

By reference to the tabulation it will be seen that the picture painted above changed somewhat in 1934 and 1935, during which there was a slight upward trend in railroad riding and a rather startling increase in bus patronage. It is significant that, concurrently with the establishment of the 1½ cents a mile coach fare in the South in December, 1933, and the 2-cent coach fare in the West, the bus patronage rose from 329,000,000 in 1933 to 654,000,000 in 1935, or an increase of nearly 99 per cent, while the rail patronage increased from 433,000,000 in 1933 to 446,000,000 in 1935, or only a little more than 3 per cent. There was also an increase of 10 per cent in the number of automobiles registered.

It should be remembered that the Interstate Commerce Commission did not find the low fares prevailing throughout the South and West during 1934 and 1935 either unreasonable or unlawful. Viewing the situation from the angle of the trend of bus patronage and the increase in automobile registration in the face of such fares, it can be concluded with reasonable assurance that the decision of the Commission lowering the maximum basic fare in coaches from 3.6 cents to 2 cents will not in the future adversely affect either the automobile business or transportation by bus.

The tabulation Table B sheds some further light on what has gone before. It shows that the decline in the class of

(Turn to page 884, please)

Table B—Comparison of Commuters and Other Railroad Passengers

Calendar Year	No. of Commuters Hauled (Millions)	Trend of Commuter Travel	Percentage of Commuters to Total Passengers	No. of Other Passengers Hauled (Millions)	Trend of Other Passengers	Average Rate of Fare Paid by Other Passengers	Average Distance Traveled by Other Passengers
1920	428.8	100	33.8	841.1	100	....	....
1924	443.8	103.5	46.5	506.6	60.2	3.38	60.3
1926	442.2	103.3	53.7	382.4	45.4	3.35	69.7
1929	457.0	109.7	57.2	329.4	39.2	3.29	75.2
1932	315.6	73.7	65.5	165.2	19.7	2.70	73.6
1934	263.6	61.6	58.3	189.6	22.5	2.17	74.1

The Parts Business Is Good Thank You!

IN the May 23rd issue of AUTOMOTIVE INDUSTRIES an analysis of the financial statements of car manufacturers was tabulated under the title of "Eleven Car Makers Double Earnings." On the following pages appears a similar breakdown of the statements of a group of leading automotive suppliers and the heading might well have been, "Thirty-two Parts Suppliers Double Income for the *Third Consecutive Year.*"

From an aggregate net of $28,006,000 in 1934 to $59,388,000 in 1935 is the record of progress for these corporations. Only four of the 32 companies showed a loss in 1935, their total deficit amounting to $596,000 and only two showed a decrease in 1935 over 1934.

While motor vehicle production in 1935 showed gains of approximately 46 per cent over 1934 and 110 per cent over 1933, these 32 parts suppliers last year showed an earnings gain of 112 per cent over 1934 and 404 per cent over 1933. This compares with similar figures for the 11 most important automobile makers whose earnings in 1935 gained 130 per cent over 1934 and only 145 per cent over 1933.

Twenty-six of the 32 parts companies paid dividends in 1935 totaling $31,463,000 compared to the previous year when 20 companies paid $17,861,000. The total cash increase was approximately 76 per cent.

An increase in building activities is shown by the fact that plant and property evaluations, steadily on the decline since 1929, showed a drop of less than one per cent last year, totaling $182,536,000 in 1935 compared with $183,743,000 the year before. Meanwhile that elusive classification, "Good will, patents, etc." showed the healthy indication of dropping still further from the picture, from $11,015,000 in 1934 to $6,875,000 in 1935. Only 12 of the 32 companies listed any amount under this classification.

"Cash and securities" as well as "receivables" established new highs for the past six years, outranking 1929 by a considerable margin. Inventories, valued at $104,343,000, showed a marked increase over the 1934 figure which stood at $82,256,000.

An increase of approximately $24,000,000 is shown in the aggregate working capital of the corporations listed, as well as a decrease in funded debts of over $9,000,000. Capital and surplus combined showed an increase of six per cent in the one year period.

The ratio of current assets to liabilities is interesting in the fact that despite an increase of more than $43,000,000 in current assets, the ratio has declined from 6.2 in 1934 to 4.8 in 1935.

Financial Analysis of

Net Income‡*

	1929	1931	1932	1933	1934	1935
American Chain	$3,279	d$2,183	d$2,986	d$432	$492	$1,646
Armstrong Cork	4,891	d3,364	d2,259	3,204	1,973	3,435
Bendix Aviation Corp.	7,417	1,555	d1,601	1,243	1,903	3,164
Bohn Aluminum and Brass	2,620	295	d721	1,495	1,518	1,589
Borg-Warner	6,685	1,208	d598	1,196	3,751	6,983
Briggs Manufacturing Co.	2,427	684	d1,896	1,591	5,122	9,266
Campbell, Wyant & Cannon	1,279	191	d313	40	d17	654
Clark Equipment Co.	1,324	d121	d802	d108	d74	d260
Detroit Steel Products	1,024	d738	d788	d199	153	311
Eaton Manufacturing Co.	1,502	243	d674	360	978	1,838
Electric Autolite	14,514	3,914	1,364	684	1,212	2,909
Electric Storage Battery	7,911	2,770	1,260	2,022	2,004	2,248
Fedders Manufacturing Co.	231	d156	d103	d215	89	234
Federal-Mogul	306	d83	d150	62	102	209
Gabriel Co.	d339	d378	d108	d131	d141	d113
Hayes Body	d245	d880	d294	d288	d122	d59
Houdaille-Hershey	1,519	102	d590	d112	d931	d164
Marlin-Rockwell	2,707	d23	d123	111	538	1,112
McCord Radiator	618	d284	d649	25	d28	251
Midland Steel Products	2,555	776	d221	673	681	1,634
Motor Products	2,141	d18	d518	d217	135	1,080
Motor Wheel	3,480	d572	d1,187	122	410	1,088
Mullins Manufacturing Co.	477	100	d696	d268	187	428
Murray Corporation	1,308	d1,241	d1,881	d777	d798	1,430
Raybestos-Manhattan	3,206	554	d457	685	751	1,374
Spicer Manufacturing Co.	2,120	d1,016	d1,414	d131	670	629
Stewart-Warner	6,839	d1,830	d2,445	d1,791	572	1,724
Thompson Products	1,231	d107	d182	174	381	709
Timken Detroit Axle Co.	1,513	328	d1,194	d1,257	426	1,173
Timken Roller Bearing Co.	14,155	2,571	d483	2,173	3,486	7,483
Trico Products	2,250	1,763	965	1,418	1,772	3,567
L. A. Young Spring & Wire Co.	2,213	522	d196	418	811	1,816
Totals	$103,158	$4,582	d$21,940	$11,770	$28,006	$59,388

Dividends*

	1929	1931	1932	1933	1934	1935
American Chain	$935	$1,008	.....	.....	.....	.....
Armstrong Cork	1,853	916	.....	.....	$302	$1,058
Bendix Aviation Corp.	3,126	2,097	$315	.....	.....	.....
Bohn Aluminum and Brass	1,580	529	.....	$352	1,057	793
Borg-Warner	4,365	1,461	530	518	1,663	2,215
Briggs Manufacturing Co.	.....	2,994	490	.....	3,391	5,836
Campbell, Wyant & Cannon	663	343	.....	.....	.....	223
Clark Equipment Co.	602	448	80	138	266	266
Detroit Steel Products	130	.....	.....	.....	.....	.....
Eaton Manufacturing Co.	894	743	82	131	835	1,124
Electric Autolite	5,694	4,767	1,987	293	298	1,021
Electric Storage Battery	4,542	4,013	2,198	1,815	2,042	3,177
Fedders Manufacturing Co.	75	.....	.....	.....	.....	38
Federal-Mogul	171	.....	.....	.....	.....	15
Gabriel Co.	.....	.....	.....	.....	.....	.....
Hayes Body	.....	.....	.....	.....	.....	.....
Houdaille-Hershey	1,080	436	108	.....	435	1,687
Marlin-Rockwell	2,182	728	308	236	753	1,103
McCord Radiator	332	61	.....	.....	.....	.....
Midland Steel Products	1,637	1,597	759	664	664	1,037
Motor Products	2,079	388	286	.....	.....	783
Motor Wheel	1,985	839	.....	.....	.....	361
Mullins Manufacturing Co.	210	151	.....	.....	.....	.....
Murray Corporation	827	17	16	16	16	8
Raybestos-Manhattan	1,538	1,389	453	386	642	638
Spicer Manufacturing Co.	300	280	264	216	257	210
Stewart-Warner	4,178	.....	.....	.....	.....	621
Thompson Products	606	336	85	.....	51	45
Timken Detroit Axle Co.	1,017	388	194	194	193	175
Timken Roller Bearing Co.	7,223	6,029	3,316	1,688	2,773	7,234
Trico Products	834	937	937	937	937	919
L. A. Young Spring & Wire Co.	1,102	874	388	.....	486	876
Totals	$51,760	$33,769	$12,796	$7,584	$17,861	$31,463

Plant and Property*†

	1929	1931	1932	1933	1934	1935
American Chain	$13,136	$12,614	$11,758	$10,871	$10,104	$9,256
Armstrong Cork	25,402	25,376	24,636	18,104	17,561	17,097
Bendix Aviation Corp.	7,985	11,486	10,196	9,634	9,066	9,141
Bohn Aluminum and Brass	5,115	5,029	2,693	2,564	2,459	2,589
Borg-Warner	17,545	17,665	15,750	14,248	13,290	13,919
Briggs Manufacturing Co.	20,446	19,901	11,039	9,840	10,170	9,585
Campbell, Wyant & Cannon	3,875	3,573	3,363	3,190	3,210	3,189
Clark Equipment Co.	6,083	5,007	4,424	4,011	3,888	4,034
Detroit Steel Products	3,104	2,990	2,818	2,660	2,677	2,686
Eaton Manufacturing Co.	10,908	7,720	7,476	6,832	7,201	7,355
Electric Autolite	11,280	11,304	8,238	7,625	8,991	11,553
Electric Storage Battery	13,018	11,497	10,715	9,965	9,513	8,994
Fedders Manufacturing Co.	1,450	1,251	1,120	1,007	910	886
Federal-Mogul	1,078	1,061	990	909	872	868
Gabriel Co.	743	694	682	659	524	519
Hayes Body	3,661	3,137	2,263	2,060	1,609	1,542
Houdaille-Hershey	4,635	7,344	7,104	6,404	6,040	5,758
Marlin-Rockwell	2,599	2,099	1,856	1,627	1,469	1,351
McCord Radiator	4,140	3,175	2,732	2,339	2,363	2,219
Midland Steel Products	6,014	5,377	4,933	4,729	4,804	4,679
Motor Products	4,364	3,918	3,647	3,584	3,626	2,411
Motor Wheel	7,230	6,693	6,273	5,588	5,631	5,712
Mullins Manufacturing Co.	4,434	4,980	3,235	1,745	1,717	1,747
Murray Corporation	20,790	19,468	10,099	9,640	9,423	8,904
Raybestos-Manhattan	7,543	7,014	6,769	6,453	6,406	6,786
Spicer Manufacturing Co.	8,807	6,785	4,652	4,061	3,953	4,176
Stewart-Warner	17,211	12,411	11,794	8,992	7,530	7,217
Thompson Products	3,298	3,498	3,459	1,958	1,980	2,256
Timken Detroit Axle Co.	7,730	7,491	6,819	6,078	5,517	5,051
Timken Roller Bearing Co.	23,207	20,715	18,769	17,288	15,928	15,371
Trico Products	1,601	1,655	1,606	1,497	1,445	1,501
L. A. Young Spring & Wire Co.	4,028	3,715	3,355	3,517	3,866	4,184
Totals	$268,799	$254,006	$215,263	$189,679	$183,743	$182,536

Good Will, Patents, Etc.*

	1929	1931	1932	1933	1934	1935
American Chain	$2,649	$1,899	$832	$635	$585	$530
Armstrong Cork	966	906	830	185	122	108
Bendix Aviation Corp.	33,281	36,801	.....	.....	.....	.....
Bohn Aluminum and Brass	181	134	124	104	87	70
Borg-Warner	679	465	421	405	380	144
Briggs Manufacturing Co.	.....	.....	.....	.....	.....	.....
Campbell, Wyant & Cannon	.....	.....	.....	.....	.....	.....
Clark Equipment Co.	.....	.....	.....	.....	.....	.....
Detroit Steel Products	.....	.....	.....	.....	.....	.....
Eaton Manufacturing Co.	337	282	271	223	216	300
Electric Autolite	.....	.....	.....	.....	.....	.....
Electric Storage Battery	.....	.....	.....	.....	.....	.....
Fedders Manufacturing Co.	.....	.....	.....	.....	.....	.....
Federal-Mogul	.....	156	.....	.....	.....	.....
Gabriel Co.	.....	6	.....	.....	.....	.....
Hayes Body	.....	.....	.....	.....	.....	.....
Houdaille-Hershey	.....	.....	.....	.....	.....	.....
Marlin-Rockwell	.....	.....	.....	.....	.....	.....
McCord Radiator	.....	.....	.....	595	595	595
Midland Steel Products	6,014	5,377	4,933	4,729	4,804	1,874
Motor Products	.....	.....	.....	.....	.....	.....
Motor Wheel	.....	.....	.....	.....	.....	.....
Mullins Manufacturing Co.	86	94	14	22	27	34
Murray Corporation	301	296	.....	.....	.....	.....
Raybestos-Manhattan	595	595	595	595	595	595
Spicer Manufacturing Co.	209	174	.....	.....	.....	.....
Stewart-Warner	.....	.....	.....	.....	.....	.....
Thompson Products	834	830	827	824	831	835
Timken Detroit Axle Co.	.....	1,684	1,684	1,624	1,564	1,505
Timken Roller Bearing Co.	.....	.....	.....	.....	.....	.....
Trico Products	351	337	336	330	309	285
L. A. Young Spring & Wire Co.	479	275	275	1,110	900	.....
Totals	$46,962	$50,311	$11,142	$11,381	$11,015	$6,875

† After depreciation ‡ After interest, taxes, etc. *000 omitted

Parts Makers—1929-1935

Cash and Securities*

	1929	1931	1932	1933	1934	1935
American Chain	$969	$996	$1,403	$1,248	$2,003	$1,425
Armstrong Cork	2,776	6,122	8,142	5,994	8,552	8,613
Bendix Aviation Corp.	8,132	3,941	3,537	4,996	7,233	8,452
Bohn Aluminum and Brass	2,948	460	483	134	162	272
Borg-Warner	8,401	7,175	7,493	7,637	7,842	9,070
Briggs Manufacturing Co.	2,324	7,540	6,691	6,913	8,642	7,856
Campbell, Wyant & Cannon	569	790	770	618	590	778
Clark Equipment Co.	1,798	2,072	2,227	2,052	1,973	1,422
Detroit Steel Products	1,345	500	380	145	163	212
Eaton Manufacturing Co.	1,212	2,562	2,030	2,375	2,462	1,914
Electric Autolite	10,527	1,994	918	1,269	2,394	1,830
Electric Storage Battery	9,734	14,983	16,190	16,362	16,377	16,781
Fedders Manufacturing Co.	220	264	236	118	85	261
Federal-Mogul	113	81	83	52	50	111
Gabriel Co.	167	217	99	113	84	47
Hayes Body	223	16	11	12	46	47
Houdaille-Hershey	1,997	1,927	2,038	1,793	2,293	2,871
Marlin-Rockwell	5,832	3,834	3,521	3,100	2,682	3,846
McCord Radiator	316	156	104	116	156	171
Midland Steel Products	7,363	6,096	4,907	4,600	4,199	4,351
Motor Products	3,048	2,950	2,060	1,399	2,054	2,808
Motor Wheel	3,960	1,996	1,537	298	645	959
Mullins Manufacturing Co.	441	427	84	149	64	409
Murray Corporation	1,617	3,358	2,965	706	319	1,545
Raybestos-Manhattan	3,472	3,164	3,325	2,641	2,666	2,235
Spicer Manufacturing Co.	704	693	1,122	731	866	601
Stewart-Warner	3,039	4,649	2,851	1,274	1,043	2,427
Thompson Products	740	155	162	212	174	335
Timken Detroit Axle Co.	3,680	3,487	3,050	2,700	2,065	2,029
Timken Roller Bearing Co.	13,615	14,037	13,556	14,210	16,455	16,616
Trico Products	1,620	3,459	3,700	4,421	5,314	7,717
L. A. Young Spring & Wire Co.	2,182	1,378	939	394	1,130	794
Totals	$105,084	$101,479	$96,614	$88,782	$100,783	$108,805

Receivables*

	1929	1931	1932	1933	1934	1935
American Chain	$5,862	$2,759	$1,902	$2,472	$2,373	$3,025
Armstrong Cork	4,695	1,739	1,688	2,116	1,938	3,479
Bendix Aviation Corp.	2,331	1,870	1,344	1,525	2,254	3,109
Bohn Aluminum and Brass	1,242	683	475	909	1,043	1,410
Borg-Warner	3,188	2,337	1,269	1,729	4,042	5,493
Briggs Manufacturing Co.	5,893	760	1,294	3,741	5,244	6,319
Campbell, Wyant & Cannon	484	196	143	278	378	905
Clark Equipment Co.	631	240	118	160	237	394
Detroit Steel Products	1,649	932	558	506	858	914
Eaton Manufacturing Co.	1,034	840	689	626	1,561	2,036
Electric Autolite	3,983	2,165	1,742	1,915	3,057	5,382
Electric Storage Battery	7,217	4,331	3,297	3,158	3,319	3,451
Fedders Manufacturing Co.	423	141	178	132	224	286
Federal-Mogul	312	196	163	219	275	439
Gabriel Co.	79	99	39	51	67	40
Hayes Body	605	390	142	84	116	68
Houdaille-Hershey	687	368	237	645	1,161	1,455
Marlin-Rockwell	432	180	140	212	703	456
McCord Radiator	1,067	430	341	451	474	641
Midland Steel Products	1,010	495	770	863	1,419	1,874
Motor Products	517	328	329	440	759	1,201
Motor Wheel	994	534	586	663	848	1,292
Mullins Manufacturing Co.	470	811	214	223	401	427
Murray Corporation	2,828	634	731	1,941	1,480	1,503
Raybestos-Manhattan	1,732	1,254	1,019	1,434	1,580	2,013
Spicer Manufacturing Co.	1,217	711	293	613	695	1,129
Stewart-Warner	4,082	1,733	1,168	1,298	1,824	2,090
Thompson Products	698	518	356	425	621	1,084
Timken Detroit Axle Co.	1,763	1,922	1,255	1,083	1,785	3,148
Timken Roller Bearing Co.	1,963	1,087	551	1,545	2,047	2,294
Trico Products	691	519	389	414	594	1,305
L. A. Young Spring & Wire Co.	1,074	590	472	700	1,019	1,828
Totals	$60,853	$31,792	$23,892	$32,571	$44,397	$62,490

Inventories*

	1929	1931	1932	1933	1934	1935
American Chain	$7,596	$6,418	$4,646	$4,401	$4,669	$5,007
Armstrong Cork	18,544	7,236	5,227	8,773	7,868	9,287
Bendix Aviation Corp.	5,239	3,993	3,066	4,020	4,110	5,498
Bohn Aluminum and Brass	2,212	3,785	2,977	4,592	4,304	4,952
Borg-Warner	7,632	5,046	3,877	5,625	8,283	9,158
Briggs Manufacturing Co.	(a)9,867	(a)5,232	(a)5,539	(a)6,352	(a)8,891	(a)12,739
Campbell, Wyant & Cannon	817	296	209	454	538	689
Clark Equipment Co.	2,436	1,586	1,117	1,106	1,227	1,376
Detroit Steel Products	1,425	887	563	625	618	810
Eaton Manufacturing Co.	2,298	2,451	1,797	1,961	2,306	2,494
Electric Autolite	4,336	2,510	1,954	2,223	3,480	6,328
Electric Storage Battery	7,576	4,692	3,492	4,031	4,220	5,248
Fedders Manufacturing Co.	588	196	198	335	486	546
Federal-Mogul	497	509	410	486	558	709
Gabriel Co.	162	121	132	99	63	61
Hayes Body	1,951	232	179	113	179	213
Houdaille-Hershey	1,756	726	723	913	1,380	2,193
Marlin-Rockwell	1,646	730	602	896	1,053	986
McCord Radiator	1,208	715	414	626	687	889
Midland Steel Products	1,132	809	643	1,357	1,072	1,695
Motor Products	1,210	659	524	1,202	881	1,180
Motor Wheel	2,821	1,489	1,144	2,214	1,695	2,263
Mullins Manufacturing Co.	1,750	1,269	861	460	504	343
Murray Corporation	4,630	3,296	2,186	2,653	2,862	3,225
Raybestos-Manhattan	4,759	2,326	1,933	3,309	3,477	4,138
Spicer Manufacturing Co.	4,328	1,627	610	1,089	1,456	1,920
Stewart-Warner	7,771	2,869	2,194	2,581	3,176	3,540
Thompson Products	1,995	765	809	876	1,034	1,812
Timken Detroit Axle Co.	4,788	3,248	2,634	2,413	3,019	3,161
Timken Roller Bearing Co.	10,676	6,292	4,927	7,074	7,629	9,872
Trico Products	668	606	451	435	489	710
L. A. Young Spring & Wire Co.	1,204	804	771	1,552	1,042	1,301
Totals	$125,878	$73,420	$56,809	$74,846	$82,256	$104,343

Current Assets*

	1929	1931	1932	1933	1934	1935
American Chain	$14,427	$10,173	$7,950	$8,121	$9,045	$9,457
Armstrong Cork	27,337	16,514	15,538	17,884	20,047	21,638
Bendix Aviation Corp.	25,573	9,803	7,947	10,541	13,597	17,059
Bohn Aluminum and Brass	6,450	4,987	4,298	5,648	5,537	6,634
Borg-Warner	19,222	14,645	12,674	14,992	20,168	23,720
Briggs Manufacturing Co.	18,084	13,532	13,525	17,007	22,778	26,914
Campbell, Wyant & Cannon	1,870	1,281	1,122	1,351	1,506	2,372
Clark Equipment Co.	5,304	4,214	3,501	3,358	3,463	3,222
Detroit Steel Products	4,419	2,320	1,501	1,276	1,639	1,936
Eaton Manufacturing Co.	4,544	6,180	4,516	4,962	6,330	6,444
Electric Autolite	18,876	6,669	4,614	5,407	8,931	13,544
Electric Storage Battery	24,567	24,368	23,111	23,691	24,044	25,604
Fedders Manufacturing Co.	1,270	601	612	544	795	1,093
Federal-Mogul	922	786	657	755	882	1,259
Gabriel Co.	1,238	437	271	366	313	273
Hayes Body	2,818	642	341	210	342	328
Houdaille-Hershey	4,441	3,048	3,033	3,351	4,834	6,419
Marlin-Rockwell	7,910	4,744	4,263	4,208	4,438	5,288
McCord Radiator	2,592	1,301	860	1,194	1,318	1,701
Midland Steel Products	9,505	7,401	6,321	6,820	6,690	7,860
Motor Products	4,775	3,938	2,913	3,041	3,695	5,226
Motor Wheel	7,775	4,019	3,266	3,175	3,188	4,514
Mullins Manufacturing Co.	2,661	2,507	1,159	831	969	1,179
Murray Corporation	9,074	7,288	5,883	6,301	4,661	6,272
Raybestos-Manhattan	9,963	6,745	6,278	7,385	7,723	8,403
Spicer Manufacturing Co.	6,249	3,031	2,025	2,433	3,018	3,651
Stewart-Warner	14,892	9,251	6,213	5,155	6,043	8,057
Thompson Products	3,433	1,437	1,327	1,513	1,829	3,231
Timken Detroit Axle Co.	10,231	8,658	6,940	6,195	6,869	8,374
Timken Roller Bearing Co.	26,254	21,487	19,056	22,829	26,131	28,783
Trico Products	3,054	4,944	4,896	5,649	6,998	10,415
L. A. Young Spring & Wire Co.	4,550	2,786	2,196	2,650	3,193	3,923
Totals	$304,280	$209,437	$178,807	$197,846	$231,014	$274,793

(a) Includes dies, jigs, etc., billed

*000 Omitted

Financial Analysis of Parts Makers—1929-1935

Current Liabilities*

	1929	1931	1932	1933	1934	1935
American Chain	$1,826	$778	$610	$648	$697	$1,293
Armstrong Cork	8,524	766	578	1,465	1,154	2,459
Bendix Aviation Corp.	3,542	2,142	1,340	1,501	1,859	2,868
Bohn Aluminum and Brass	1,375	325	223	702	798	1,976
Borg-Warner	4,392	2,781	1,118	1,816	4,688	6,341
Briggs Manufacturing Co.	5,454	2,503	1,909	2,683	7,234	9,048
Campbell, Wyant & Cannon	502	207	136	167	247	621
Clark Equipment Co.	569	187	102	140	210	342
Detroit Steel Products	1,539	928	851	693	534	584
Eaton Manufacturing Co.	1,304	900	605	680	1,490	1,958
Electric Autolite	4,784	1,488	1,018	843	2,410	4,926
Electric Storage Battery	2,633	1,110	822	972	1,362	1,677
Fedders Manufacturing Co.	320	83	70	93	158	251
Federal-Mogul	355	250	253	241	261	436
Gabriel Co.	64	66	38	43	46	75
Hayes Body	1,072	179	277	198	275	229
Houdaille-Hershey	1,001	413	388	569	959	1,451
Marlin-Rockwell	1,800	242	118	111	173	896
McCord Radiator	560	277	258	384	655	841
Midland Steel Products	1,431	612	239	845	826	1,263
Motor Products	1,043	323	285	980	679	1,552
Motor Wheel	1,091	1,036	1,438	1,366	758	1,189
Mullins Manufacturing Co.	225	1,271	581	466	363	233
Murray Corporation	2,271	873	581	1,225	1,680	1,356
Raybestos-Manhattan	1,143	349	313	609	771	1,237
Spicer Manufacturing Co.	2,504	696	418	626	778	1,264
Stewart-Warner	2,773	948	783	1,404	1,155	1,741
Thompson Products	1,483	496	522	541	542	1,394
Timken Detroit Axle Co.	1,538	1,095	279	501	860	919
Timken Roller Bearing Co.	3,694	1,144	512	1,572	1,674	3,101
Trico Products	846	759	615	779	1,079	2,368
L. A. Young Spring & Wire Co.	679	402	292	456	775	1,019
Totals	$62,336	$25,629	$17,572	$25,319	$37,150	$56,908

Working Capital*

	1929	1931	1932	1933	1934	1935
American Chain	$12,601	$9,395	$7,340	$7,472	$8,348	$8,164
Armstrong Cork	16,813	15,649	14,960	16,369	18,892	19,179
Bendix Aviation Corp.	22,031	7,661	6,607	9,040	11,738	14,191
Bohn Aluminum and Brass	5,076	4,662	4,076	4,946	4,739	4,658
Borg-Warner	14,830	11,864	11,556	13,176	15,480	17,379
Briggs Manufacturing Co.	12,630	11,029	11,615	14,324	15,545	17,865
Campbell, Wyant & Cannon	1,369	1,075	986	1,184	1,259	1,751
Clark Equipment Co.	4,735	4,027	3,399	3,218	3,253	2,881
Detroit Steel Products	2,880	1,391	649	583	1,105	1,351
Eaton Manufacturing Co.	3,240	5,279	3,911	4,283	4,841	4,486
Electric Autolite	14,092	5,180	3,596	4,564	6,521	8,619
Electric Storage Battery	21,933	22,958	22,289	22,718	22,683	23,927
Fedders Manufacturing Co.	950	518	542	451	637	842
Federal-Mogul	567	536	404	514	621	823
Gabriel Co.	1,174	371	233	323	267	198
Hayes Body	1,746	462	64	12	67	99
Houdaille-Hershey	3,439	2,635	2,610	2,781	3,875	4,967
Marlin-Rockwell	6,109	4,502	4,145	4,098	4,265	4,392
McCord Radiator	2,032	1,025	602	810	663	861
Midland Steel Products	8,074	6,789	6,082	5,975	5,864	6,597
Motor Products	3,733	3,615	2,628	2,061	3,016	3,674
Motor Wheel	6,684	2,983	1,828	1,810	2,431	3,325
Mullins Manufacturing Co.	2,436	1,236	577	365	606	946
Murray Corporation	6,803	6,415	5,301	4,075	2,982	4,916
Raybestos-Manhattan	8,819	6,396	5,965	6,776	6,951	7,166
Spicer Manufacturing Co.	3,746	2,335	1,608	1,807	2,240	2,387
Stewart-Warner	12,119	8,303	5,430	3,751	4,888	6,316
Thompson Products	1,951	941	805	972	1,286	1,837
Timken Detroit Axle Co.	8,693	7,563	6,661	5,695	6,009	7,455
Timken Roller Bearing Co.	22,560	20,343	18,544	21,257	24,457	25,682
Trico Products	2,209	4,186	4,281	5,006	5,919	8,047
L. A. Young Spring & Wire Co.	3,871	2,384	1,904	2,194	2,417	2,904
Totals	$239,945	$183,708	$161,198	$172,610	$193,870	$217,885

Funded Debt*

	1929	1931	1932	1933	1934	1935
American Chain	$5,200	$4,194	$3,844	$4,352	$3,458	$1,568
Armstrong Cork	.....	13,866	13,481	12,878	12,752	9,000
Bendix Aviation Corp.	101	611	432	302	239	142
Bohn Aluminum and Brass	1,902	1,875	1,767	1,411	499	.....
Borg-Warner	1,909	1,601	1,586	1,075	1,075	.....
Briggs Manufacturing Co.	.....	.....	.....	.....	.....	.....
Campbell, Wyant & Cannon	.....	.....	.....	.....	.....	.....
Clark Equipment Co.	.....	.....	.....	.....	.....	.....
Detroit Steel Products	.....	.....	.....	.....	450	350
Eaton Manufacturing Co.	750	750	.....	.....	.....	.....
Electric Autolite	.....	.....	.....	.....	40	236
Electric Storage Battery	.....	.....	.....	.....	.....	.....
Fedders Manufacturing Co.	300	.....	.....	.....	.....	.....
Federal-Mogul	.....	65	65	30	8	.....
Gabriel Co.	.....	.....	.....	.....	.....	.....
Hayes Body	.....	.....	.....	.....	.....	.....
Houdaille-Hershey	.....	.....	.....	.....	.....	.....
Marlin-Rockwell	.....	.....	.....	.....	.....	.....
McCord Radiator	2,395	2,039	2,005	1,971	1,877	1,766
Midland Steel Products	.....	.....	.....	.....	.....	.....
Motor Products	.....	.....	.....	.....	.....	.....
Motor Wheel	.....	.....	.....	.....	.....	.....
Mullins Manufacturing Co.	.....	.....	.....	.....	.....	.....
Murray Corporation	3,185	2,500	2,250	2,000	1,750	.....
Raybestos-Manhattan	.....	.....	.....	.....	.....	.....
Spicer Manufacturing Co.	.....	.....	.....	.....	.....	.....
Stewart-Warner	.....	.....	.....	.....	.....	.....
Thompson Products	.....	.....	.....	.....	.....	.....
Timken Detroit Axle Co.	.....	1,062	940	628	.....	.....
Timken Roller Bearing Co.	.....	.....	.....	.....	.....	.....
Trico Products	35	.....	.....	.....	.....	.....
L. A. Young Spring & Wire Co.	642	314	223	175	111	.....
Totals	$16,419	$28,877	$26,593	$24,822	$22,259	$13,062

Capital and Surplus*

	1929	1931	1932	1933	1934	1935
American Chain	$22,468	$18,680	$16,336	$15,763	$16,296	$16,551
Armstrong Cork	48,724	37,820	35,200	30,843	33,137	34,747
Bendix Aviation Corp.	63,513	61,590	21,666	22,965	24,867	27,369
Bohn Aluminum and Brass	8,637	8,273	5,434	6,576	7,038	7,644
Borg-Warner	32,278	30,551	28,256	28,964	30,782	34,297
Briggs Manufacturing Co.	32,530	32,990	22,895	24,486	26,237	30,155
Campbell, Wyant & Cannon	5,556	5,399	5,085	5,126	5,089	5,521
Clark Equipment Co.	10,955	9,704	7,851	7,424	7,349	7,095
Detroit Steel Products	5,790	4,430	3,547	3,345	3,498	3,713
Eaton Manufacturing Co.	11,085	11,864	11,169	11,422	11,192	12,204
Electric Autolite	26,021	21,045	14,708	14,660	17,969	20,428
Electric Storage Battery	37,013	36,519	35,355	35,400	35,212	35,370
Fedders Manufacturing Co.	2,134	1,831	1,731	1,513	1,600	1,757
Federal-Mogul	1,605	1,669	1,363	1,425	1,527	1,721
Gabriel Co.	1,825	1,269	1,161	1,021	880	767
Hayes Body	5,532	3,680	2,734	2,185	1,771	1,716
Houdaille-Hershey	8,974	10,236	9,381	9,272	9,894	10,448
Marlin-Rockwell	8,943	7,209	6,735	6,609	6,394	6,409
McCord Radiator	4,317	2,576	2,182	2,120	1,994	2,178
Midland Steel Products	15,238	14,075	13,494	13,502	13,519	14,116
Motor Products	7,996	7,605	6,343	5,754	6,734	4,128
Motor Wheel	14,932	11,028	9,036	8,557	8,970	9,488
Mullins Manufacturing Co.	7,353	6,443	4,004	2,258	2,445	2,798
Murray Corporation	24,864	23,663	12,674	11,954	11,252	14,120
Raybestos-Manhattan	17,879	15,876	14,966	15,294	15,433	16,169
Spicer Manufacturing Co.	13,369	11,589	8,211	7,864	7,230	7,649
Stewart-Warner	30,667	20,696	17,183	13,129	11,528	13,137
Thompson Products	6,522	5,494	5,245	3,905	4,239	4,904
Timken Detroit Axle Co.	17,851	16,687	15,299	13,699	13,912	14,666
Timken Roller Bearing Co.	46,458	43,305	39,506	40,080	40,793	41,042
Trico Products	4,703	6,494	6,522	7,003	7,837	10,036
L. A. Young Spring & Wire Co.	8,684	7,870	7,102	6,989	7,112	7,145
Totals	$554,416	$498,160	$392,374	$381,107	$393,730	$419,488

*000 Omitted

Just Among Ourselves

Real Profit and The Profit Motive

A MAN who says things when he talks is W. J. Cameron of the Ford Motor Company. His Sunday night radio addresses are, in the opinion of many listeners, outstanding contributions to general education and to the furtherance of basically sound thinking. Profit, said Mr. Cameron over the air last Sunday night, is what the user gets out of the product.

The real profit from the telephone, the radio, the automobile, from better shoes and clothing, from cracked wheat or fertilizer is not to be measured by the size of dividend checks or the frequency with which they are sent to stockholders of producing companies. It is the profit to those who buy. No one pays for any of these things or for anything if he does not expect to get from it greater value than he puts in. The urge to buy is the urge to earn. We can never get rid of the profit motive.

How does the relatively puny pile of dollars that have been earned by the most successful automobile manufacturing companies combined, compare with the highly heaped benefits that mankind has derived from the use of the automobile? The real profit from the development and production of the automobile—the profit which the user gets—is measurable only to a slight extent in dollars saved or dollars earned even though the aggregate of these dollars is immensely greater than that of the dollars which the manufacturers can show on their books in profit figures.

The real profit from the automobile—the immeasurably greater profit— can be expressed only in terms of time and general good. The profit motive spurred the making of the automobile. The profit motive prompted it's being put to use. The greater profit from it grows from the urge to use it.

Reactionary "Progress"

THERE are some, these days —and many of them are in Washington—who have been hit on the head by what they think is a new idea. They have been hit on the head, they give evidence of that, for they seem to be dizzy and d a z e d and are turned about so that they face in the direction from which we have come as they cry out, "Forward!"

They are groggy and they are confused. They are looking the wrong way. But it was not a new idea that hit them. It was a dense, heavy clod of muddy thinking with a solid chunk of historical ignorance at the core. That is, probably, the kindest way in which to consider their present plight.

To all these dizzy ones, these turned-about ones, we recommend a careful, thoughtful reading of an address by Walter Lippmann, delivered on Monday of this week during the commencement exercises at the University of Rochester. Let them study his words and test the accuracy with which he recalls history. Let them apply the best logic they can employ in an effort to deduce the consequences of their own proposals. If they do that, there is hope that they may rightly conclude that they are really looking backward.

Here, in part, is what Mr. Lippmann said:

"The deepest issue of our time is whether the civilized peoples can maintain and develop a free society or whether they are to fall back into the ancient order of things when the whole of men's e x i s t e n c e, their consciences, their science, their arts, their labor, and their integrity as individuals were at the disposition of the rulers of the state. The world is faced with a stupendous reaction and what makes that reaction peculiarly dangerous is that those who are leading this reaction are for the most part convinced that they are the leaders of progress. Not to believe that government must regulate all human affairs is currently regarded as stupidly reactionary by those who imagine themselves the pioneers of a new world. No one these days can, it would seem, conceive a project for the improvement of men's condition except by magnifying and intensifying the activity of governments.

"But governments are composed of men, not supermen, not geniuses, mere men, imperfectly educated, not wholly disinterested, with very limited wisdom. Such men can operate only a government of limited powers, and no greater delusion has ever cast its spell upon the human imagination than that a group of mortal men can plan the future of a society and direct the affairs of a whole civilization. It is the presumption of ignorance to believe that; to attempt it is

(Turn to page 888, please)

The Horizons of Business

by Joseph Stagg Lawrence

The Platform

THE Republican platform, it seems, is less than perfect. The diligent reader of the public press is appalled by the devastating array of fatal flaws, constitutional defects, intolerable inconsistencies, unworthy ambiguities, mischievous obscurities, pusillanimous pussy footing, etc. which it seems to contain. As a statement of political principles it is lame, halt, blind and *non compos mentis*. It is both too long and too short. It is too explicit and not explicit enough. It is New Dealish and at the same time reactionary. As we line up all the imputed faults of this remarkable document it is clear that the Republican Party, though it may not deserve to win on the strength of the platform, deserves the electoral prize by virtue of its genius for weasel words and error.

The Critics

The criticisms reflect not the document but the critics. The average editorial heavyweight takes himself as seriously as a United States Senator. Be his thinking original or adapted, professional or amateur, he has exceedingly firm convictions on one or more subjects. These convictions are his mental children whose neglect or aspersion by others is a personal affront. Ego is served by the subject's indignation and this is invariably attended by a loss of judicial balance.

Take the case of the Senator from Idaho. He conducted a vigorous preconvention campaign for the nomination. An abbreviated corporal's guard spoke up for him at the convention. In the process of securing this handful of delegates he was roundly beaten in a number of states where his henchmen boasted great strength. It would be most unkind to tabulate these disappointments and also unnecessary. The point is that a statesman who has just sustained the primary experiences which befell the gentleman from Idaho should reveal chaste humility in the councils where the principles that the successful candidate would be asked to support were being formulated. Mr. Borah spoke, according to accounts, with the arrogance of a conqueror. He was heard with courtesy and the responsible, successful candidate went as far as his honest judgment permitted in meeting the views of the Idahoan.

Making His Position Clear

In one particular Mr. Landon failed. He could not approve the theory of a managed currency so dear to the heart of Borah and, lest there be any misunderstanding about his position on this important issue, expressed himself definitely in favor of the gold standard. All the other virtues of the platform and the candidate were but chaff in the scale of the Borah judgment when weighed against the merit of a managed currency. Even as a single bad egg corrupts the integrity of an entire batch so one particular departure from Mr. Borah's schedule of political perfection forfeits his cooperation. Now the eloquent statesman from the upper house sulks in his tent and acts for all the world like a spoiled child who has just had everything he wanted but a fourth dessert.

Too Much Emphasis on the Leaves

Critics have been too easily overwhelmed by the imperfections of the Republican platform. Such appraisals do the document a grave injustice. It is true that many minds and many views are represented in the platform. At some points compromises have been incorporated with "political susceptibilities" which are difficult to reconcile. For example, "The necessities of life must be provided for the needy" while at the same time the budget will be balanced "not by increasing taxes, but by cutting expenditures." It is only a 2x4 critic who will assail the platform on such a petty count. After all the document is political and reasonable allowances should be made for its necessary "make-up." Its particular purpose is to oust the New Deal and stubstitute therefor the Republican Party. The formula for this is simple —get more people to vote for the Republican than for the Democratic candidates. In approaching this ardently sought consummation it is advisable to offend the smallest and gratify the largest possible number of voters. The Catonian critic who implies that the platform should openly repudiate relief or confirm higher taxes is impractical, politically immature or both. Furthermore it is entirely possible that we can take care of the poor without increasing taxes. It has been done before.

This is not intended as an essay upon the ingenuousness or conceit of critics. It is a candid admiration for and hearty approval of the Republican platform. We are not offended by the taint of reactionaryism nor the approach to New Deal policy which it seems to reveal. It is an intelligent consensus of the views of the most astute leaders of the opposition. As a campaign document it has extraordinary virtues which we list in the order of merit.

It is Good

1. The tenor of the convention, the character of the candidate, the disillusioning experience of "three long years" make it certain that this is a statement of principles which the party, if successful, will follow. Here is a blueprint of party intentions whose good faith need not be questioned.

2. It starts with an indictment of the New Deal which is crisp, pungent and accurate.

3. It was amended specifically by the candidate as he accepted the nomination. His reservations are explicit and made in advance.

4. It is free from effervescent flatulence about the "good old days" when the Republican party was in power. There is practically no party boasting. Only when it refers to the gravity of the great crisis in which the Party was born do we see Party pride and here the nature of the reference is dignified.

5. It acknowledges the good which the opposition has done. In the event of victory there will be no general proscription of New Deal accomplishments. In this it reveals stature, statesmanship and something less than either, political skill.

Alfred M. Landon was able to accept the platform even though he found it necessary to state three exceptions. This is two more than Mr. Borah has made. Mr. Landon thinks the platform bigger than his exceptions and holds it good. That perhaps is a significant trait of the candidate. The fact gives both party and platform a grand start.

Photo-Electric Records of Diesel Engine Combustion

From the SAE Meetings there were many highly interesting and instructive papers. Here are abstracts of a few supplementing those previously published

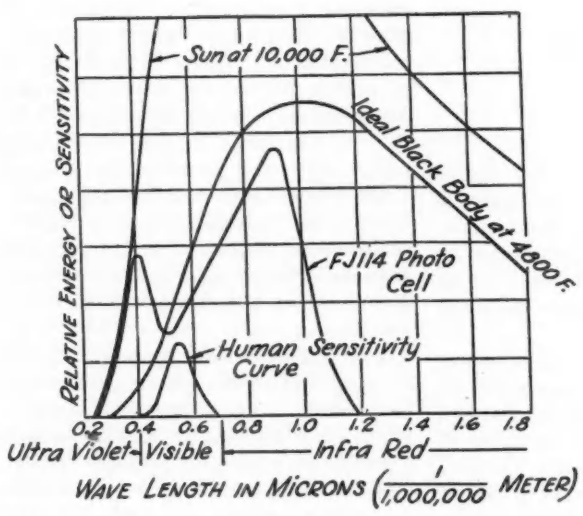
PHOTO-ELECTRIC records of combustion in Diesel engines was the subject of a paper at the SAE Summer Meeting by R. A. Rose, G. C. Wilson, and R. R. Benedict of the College of Engineering, University of Wisconsin. The apparatus described was a research set-up which required great care to insure proper operation. With this set-up many photographic records can be obtained from an actual engine turning over at 1200 r.p.m. or faster. Three impulses may be obtained per cycle and in the experiments which have been made to date these correspond to:

1. Movement of the fuel-valve stem in the fuel-injection nozzle.
2. Radiation emission in the combustion chamber.
3. Pressure in the combustion chamber.

In searching for a high-speed means of picking up impulses, the vacuum type photo-electric tube, or photo-cell, was selected. It has a high degree of sensitivity, with a time lag of zero, and is entirely free from inertia effects. Its response is directly proportional to the light received, and it is perfectly stable in its operation and free from all hunting action.

The active surface of the photo-cells used for this indicating system is Caesium, deposited on oxidized silver and enhanced by other special activation treatment. Because of its high sensitivity in the infra red, this photo-cell is especially useful in "invisible light" applications. It is also a most efficient means for detecting a low-temperature light source. Fig. 1 shows the sensitivity of this photo-cell as compared to human vision. The human eye can detect wave lengths ranging only from 0.4 to 0.7 microns, while the photo-cell is sensitive to wave lengths of 0.3 to 1.2 microns. In other words, the photo-cell is sensitive to both ultra-violet and infra-red radiations that are

Fig. 1 (Left) Sensitivity of the photo-cell


Sun at 10,000 F.
Ideal Black Body at 4900 F.
FJ114 Photo Cell
Human Sensitivity Curve
RELATIVE ENERGY OR SENSITIVITY
0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8
Ultra Violet
Visible
Infra Red
WAVE LENGTH IN MICRONS (1/1,000,000 METER)

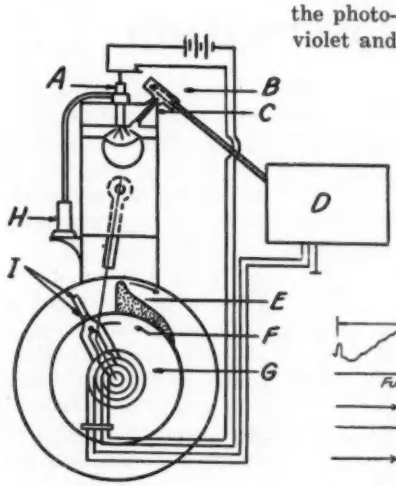


Fig. 2 (Center) Neon tube optical indicator

A—Nozzle. B—Photo-electric cell. C—Quartz rod conducts combustion radiation to photo-electric cell. D—Amplifier. E—Light intensity plotted on polar coordinates by Neon tube. F—Period of fuel injection. G—Slip rings and brushes. H—Fuel pump. I—Neon tubes rotate with flywheel at crank position.

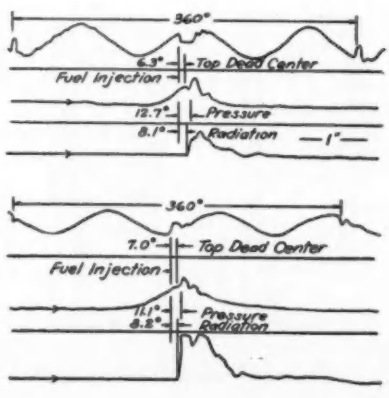


Fig. 3 (Right) Oscillograms for Diesel fuel, no load and full load

not visible. The other two curves show relative radiation energy and are included merely for purposes of comparison.

The first test results were obtained by allowing the photo-cell to look into the combustion chamber through a quartz rod that served as a window, as shown in Fig. 2. The current from the cell was amplified and delivered to a 3-in. neon tube mounted on the fly-wheel at crank position. This neon tube has the property of glowing along its length a distance proportional to the current received from the amplifier. Another small neon tube showed the period of time the valve stem was off its seat. When the pressure element was used with this set-up, another 3-in. neon tube was placed 180 degrees out of phase with the crank. This scheme furnished excellent optical diagrams on polar coordinates, but attempts to photograph these diagrams at a speed of 1200 r.p.m. were unsuccessful.

A Maihack No. 4 cantilever spring indicator was reconstructed to furnish the pick-up for the pressure impulse. The eye at the top of the piston rod was made into a small light shutter. A uniform light focused on one side of this shutter is allowed to shine through to a photo-cell on the opposite side, and the photo-cell delivers a current proportional to the pressure in the combustion chamber.

While the neon tube was suitable for visual work, for recording purposes it was necessary to develop the system so that records could be obtained on a magnetic type of oscillograph. With this a direct-coupled or so-called "d-c" amplifier was used. Fig. 3 shows two oscillograms obtained while using the same fuel with injection timed to within one degree of each other, the upper diagram for "no load" and the lower one for "full load."

In the latest set-up, for convenience of handling films, the camera, oscillograph, and developing trays are all housed in a dark room. The radiation and pressure pick-up at the engine are the same as previously described. At the top of the nozzle valve stem is mounted a small shutter which has a light source on one side and a photo-cell on the other. Thus the entire movement of the valve stem is indicated. Any tendency of this valve to reopen for any reason, such as fuel line surges, can be detected by this arrangement. The impulses from the three photo-cells are carried through amplifiers to the binding posts of a three-tube cathode-ray oscillograph.

This high-speed indicating system, recording as it does three simultaneous impulses, furnishes a means for studying a great array of combustion problems for both Diesel and Otto cycle engines. Detonation in the gasoline engine, behavior of fuel dopes, and flame spectro in both types of internal combustion engines can be studied. A microphone can be substituted for one of the other pick-ups to study the sound accompanying fuel knock. Also, light or pressure can be picked up at different parts of the combustion chamber and the rate of travel studied. The first major project is scheduled for the summer of 1936. About 24 Diesel fuels will be studied in both the present test engine and in a commercial high-speed unit having a separate combustion chamber.

How New Body Styles Are Evolved

George J. Mercer, consulting body engineer, gave a paper on "Body-Design Procedure," one of the features of which was answers to a series of questions on methods of procedure in the development of new body styles, received from three prominent body engineers.

One question asked them was with regard to the preferred number of members of the committee that passes on new design models, and whether there should be a woman member on this committee. The answers were substantially as follows: (A) Not too large, say 5 or 6, and a woman member, if properly qualified, would be an advantage; (B) One is enough, if it is the right person, and I cannot recall a single instance where I thought a design was improved by adding to the number of critics. A woman's views on interiors are sometimes very helpful. (C) In the early stages of development very few should pass on the proposed design. The chief engineer and general manager can select the desired trend, from sketched forms. The body engineer and stylist will bring the sketches up to this point, on the basis of preliminary chassis dimensions. Later, when the body is made in full size and finished, sales and manufacturing executives should also pass on the design. Until the complete-model stage is reached, an individual unfamiliar with drawing effects cannot make a satisfactory decision, and may hamper development.

Two practices seem to prevail in presenting first ideas with regard to new body types to executives for consideration, one consisting in making a large number of rough, unfinished sketches and the other in making a few perspective views, colored, and made as realistic as possible. All three answers agreed that a small number of well-finished sketches would serve the purpose best, one suggesting that these should range from something similar to the current design to something that is considered to be extreme.

All agreed that the current model must have a strong influence on the

Windows for Combustion Observation

A STUDY of materials suitable for the construction of windows for the observation of phenomena inside combustion chambers has been made by George Calinguert, S. D. Heron and Ralph Stair, the first two of the Ethyl Gasoline Corporation and the last of the National Bureau of Standards. Materials which can be used include quartz, spinel, sapphire, periclase and fluorite. The form of the window mountings, as shown by the drawings, is such as to permit of screwing them into a standard spark-plug hole.

The transparency of these materials in the infra-red region increases in the order mentioned. The mechanical strength varies greatly, being greatest for sapphire and lowest for fluorite. The resistance to the chemical action of the combustion products varies widely. Sapphire is not attacked by any products of combustion, including the lead oxide which is present when leaded fuels are used. The choice of a suitable material for a given investigation will be based on a judicious balance of the four chief characteristics, namely, mechanical strength, chemical resistance, transparency and cost.

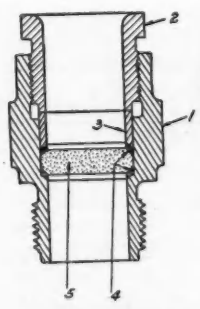


Fig. 1

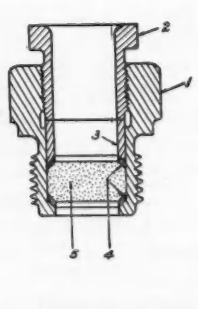


Fig. 2

Forms of window mountings

design of the new model, because the desire to save on tool and die cost is always present. It is logical that the new design be based on that of the current model, whose merits and failings are well known. Change for the sake of change merely is seldom justified, and it is necessary to show improvement over the current model with respect to style.

All three of the body engineers agreed that benefit can be derived from the employment of artistic consultants, to balance the conventional "practical man." The artist disregards the "possibility" of doing something, thereby forcing engineers and tool designers to leave beaten paths in search of new methods. The way it was expressed in one of the answers: "The artist should not be hampered too much in the early stages of the design. Let him think the world is his; that the factory can build anything he wants, and that it won't cost any more than the old design did. Get some new ideas on paper, where the practical man can get hold of them. It is surprising how many things can be done when it becomes a desirable thing from a style or comfort standpoint to do."

As to the points which have the most influence on the acceptance of the model design, one body engineer thought it was the effect of the more radical designs on the market on the buying public, while a second thought it was "the whims of management or its good judgment, as the case might be." The third, going somewhat more into detail, observed that the factor having the greatest influence was the impression received when first viewing the new design. It might be called balance in design. It involved proportion, distribution, clean lines, sense of direction, and proper ornamental relief with definite individuality.

All agreed that rushing through a new design had unfavorable effects and that time is very essential to attaining satisfactory results. Too short a time allowance will always result in many post mortems.

Data gathered by the sales force in the course of the year, as to the preferences of customers, have little value according to one of the answers, while a second admitted considerable influence on details and minor appointments.

There was agreement on the point that the production job should be an exact duplicate of the final "mock-up." This is particularly important in a large organization, where a large number of executives must pass on the design. It is still more necessary because the various components are widely separated in their development for manufacture, and unless there is a master model for guidance, many points in appearance will be over-looked, to the detriment of the production job.

A high degree of public acceptance of a current design tends to stabilize that design. When a departure is finally made, if it has sufficient merit, it establishes a new style trend. Management naturally tries to determine what features make any particular competitive car popular, and to work similar features into its own product, but in the determination of just what it is that makes a car popular, even experts are quite likely to err.

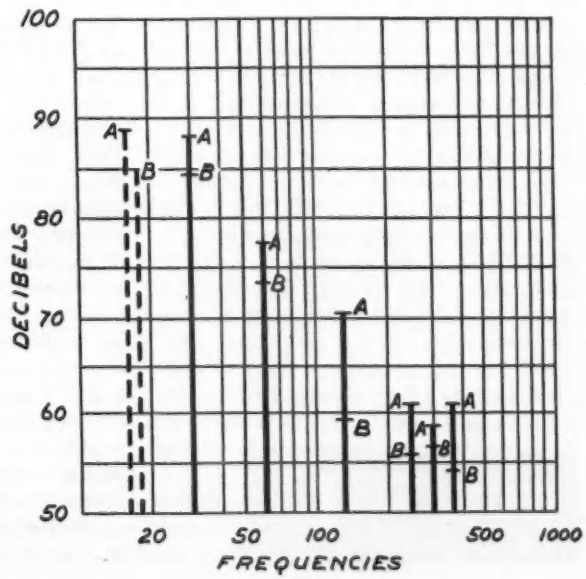
Previews of proposed new body styles, along the same lines as those given to theater patrons by the moving-picture industry, are impractical in the automobile industry. Drawings or models of new body designs should be shown only to those executives who must pass on them; this must of necessity be done far in advance of the beginning of production and the information therefore must be closely guarded. The fewer the number of people that can safely pass on a design, the less the conversation there will be about it.

New designs cannot be kept completely secret, as too many factors are involved; if there were more secrecy there would be more original thought and greater differences between makes of cars. Sometimes workmen, suppliers and tool builders do not respect the confidence that is placed in them, but this does not hold generally, for if it did the industry would have to resort to the "locked-up jury" system. As a rule, only few people know what it is really contemplated to do, and what outside sources can find out from draftsmen is of no particular value. To obtain the best protection possible it is suggested that the projects be scattered, the job being divided up as much as possible, but that the job as a whole be limited to as few as possible. In this way, while one or two features may be known, no one person can put enough pieces together to make anything out of it.

Noise Treatment

SOUND-SPECTRUM analysis is the foundation of work in connection with noise treatment of automobiles, according to G. R. Cunningham of Woodall Industries, Inc. The spectrum analysis shows at what frequencies the sound energy is greatest. Tests are made on the road under as nearly as possible standard conditions. A concrete road is usually selected, having a fairly level stretch with very little expansion-joint disturbance, and of such length as to permit of a complete run at a given speed in one direction. Such items as wind velocity and direction, tire pressure, car mileage, and the amount of gasoline are checked and recorded before and at the end of each run. A run is always made in the opposite direction, so as to arrive at a fair average. As a rule, the runs are made at constant speeds, of 30, 40, 50 and 60 m.p.h., but in some investigations other speeds are chosen. The car is driven at a steady rate, say 40 m.p.h., and use is made of a sound-level meter and a frequency analyser.

A total-noise measurement is made



Results of a complete acoustical treatment

for use in checking the total intensity of all added frequencies, thus making sure of all important audible frequencies of the spectrum. Next the frequency analysis is started by dialing the frequency selector of the analyser and the attenuator of the noise-level meter so as to get a peak on the indicating meter, at which point the intensity in decibels and the frequency selector dial are read. Continued dialing in this manner gives the complete spectrum for that microphone position and car speed. After a frequency analysis of the air is taken at various locations, the vibration velocity unit, an electro-magnetic device for transforming mechanical vibrations into voltage variations, is connected to the sound meter and frequency analyser; then by holding the point of the contact rod at various spots on the floor, panels, windows, etc., the vibration characteristics of the panels are determined and are converted into amplitude. This procedure associates or connects the high-intensity frequencies found in the air with the offending area or panels.

The data thus collected are plotted to give a complete accoustical picture of the entire body. They include total noise readings in the various zones, the frequency spectrum which indicates what the passenger actually hears, and the associated study of the panel and floor vibrations. With this complete picture available, the problem is considered from the standpoint of laboratory data on various materials, the installation angles which may arise in production, and what experiences may suggest as to the need of more unusual material or combinations of materials, what type of an accoustical installation to use, whether the greatest returns may be expected from an installation in the form of a barrier to transmission or of an absorber, etc.

To completely solve the problem it is necessary to determine the properties of the vibrating system (the whole car body), the reaction of the vibrating system or parts of the system upon and within the air column in the body, and the properties of materials in this environment which in any way affect the propogation of accoustical energy.

The graph here reproduced from Mr. Cunningham's paper shows how sounds of various frequencies were reduced by the complete accoustical treatment of a car.

Sound a Sales Element

THE Ear as a Noise-Measuring Instrument was discussed in a paper by John S. Parkinson, of the Johns-Manville Research Laboratories. Said Mr. Parkinson:

"The automotive engineer encounters noise more often as a sensation experienced by the customer than as a definite physical characteristic of his car. He wants from the acoustical engineer an index of how that car will sound to the average customer. This index should be of such a nature that it will enable him to compare this car with those of other makes and with other models of his own manufacture. If he is manufacturing mufflers or silencers his problem is still the same: he is measuring against customer judgment.

"The customer has only one means of forming his judgment, his ear. . . . If the car sounds noisy to him on the evidence of his ears, that is all he wants to know—it is condemned. And the physicist or the acoustical engineer has no reason to quarrel with this method of procedure, for he falls back upon the ear for his ultimate court of appeal in many types of instrumental measurement. . . .

"It may be asked why we bother with instruments instead of trusting entirely to ear judgments? There are a number of reasons. In the first place, no two ears are just alike, even when they both belong to the same individual. We should not know whose ear to use. In the second place, the sense of hearing, like all the senses, is susceptible to suggestion from within and from without. If we want to hear something, and if we believe that we should, it is very likely that we will.

"Another reason why the ear is not suitable as an instrument for precision measurement is that it varies from day to day with the general physical condition of the body. Fatigue, sinus trouble, a cold in the head, any one of a number of things may materially affect the acuity of hearing. The ear is also influenced by vibrations communicated thru the body to the bony structure within the ear. There are times when a person cannot judge how much of the sensation is arriving by this route, and how much thru the air to his eardrum. Furthermore, the ear is limited in its ability to differentiate sounds. Loud sounds mask faint ones, low sounds mask high ones, and the sound in which we are interested may never be able to get an audience unless we give it instrumental assistance. The ear is not sensitive to small changes in intensity or frequency. It is necessary to change the energy in a sound 25 per cent in order to produce a 5-per cent change in the apparent loudness. Changes in intensity much smaller than this may not be heard at all. If the job is one where small improvements are significant as trend indications, the ear cannot be trusted.

"All these things make the ear unreliable as an instrument in the steps of the operation. However, as we have seen, in the last analysis we must turn to the ear for a decision. The acoustical engineer's problem then is to so devise his instrument that they render their judgments in a language which the ear can understand and approve."

Safety Must Be Enforced

"SAFETY in Motor Vehicle Operation and Maintenance" was the title of a paper by J. M. Orr, general manager of the Equitable Auto Company. Quoting estimates of the American Petroleum Institute as to the number of motor vehicles that will be running on the roads of the country at several future periods, the author concludes that if these estimates prove correct, many miles of highways must be modernized and many more miles of new highways built. "Through traffic" must be carried away from our congested metropolitan centers of population. Super highways, today on paper, must become realities.

Order must come from the chaos of conflicting state requirements. Drivers must be qualified before being given freedom at the wheel. Engineering, education and enforcement are three words that have become synonymous with accident prevention. There is no question as to the ability of the engineering profession to meet today's problems and to plan adequately for the future, provided that it is given "a green light" and the funds with which to execute its plans. Education should have a most prominent place in plans to make our highways safer. Carefully planned safety material should be included in the curricula of all schools in the land. It should start in the formative elementary grades and should be carried through high school. And last, but by no means least, there must be enforcement.

PRODUCTION LINES

Two Silver Streak Pontiac radiator grilles are buffed and polished at one time as the carriage on which they are mounted slides under the rapidly rotating buffing wheels. The wheels are mounted flexibly so that they follow the irregular contour of the grille

Hard Liner

One of the important parts makers has recently acquired the license to build and merchandise a special cylinder liner which we mentioned in these columns about a year ago. This liner consists of a seamless steel tube into which is centrifugally-cast a very fine alloy iron. The surface of the metal has a hardness of 800 Brinell after machining. The manufacturing problem has been licked by a combination of grinding and honing.

Arc Welded

A new drafting room chart giving complete reference details for producing arc-welded designs has been prepared by Lincoln Electric and is ready for distribution. The chart gives the latest weld symbols, alternate symbols for fillet welds, types of joints, and tabular data. It fills a need, and we'll be glad to see that yours is taken care of.

From France

M. Maurice Goudard, distinguished French engineer and industrialist, visited us prior to the D.Y.C. banquet staged for him by Detroit Section SAE. M. Goudard confirmed our previous experience that AUTOMOTIVE INDUSTRIES is serving the European engineers and manufacturers as well as it does the industry in this country. Among other things, M. Goudard is president of Solex Carburetors which are used widely in Europe. He promises some new developments along another line which may be of great interest to factory managers in this country.

Metal-Bord

Here is a good one for you stylists and designers. Metal-Bord is a new process of replacement of metal volume and weight by a non-metallic substance. If you need a metallic finish for trim or decorative effect, you can get a sheet consisting of cardboard or similar substance to which is adhered a thin sheet of pre-finished metal. External appearance is retained but the covering is lighter, less expensive, and can be formed to any contour with little pressure—in most cases by hand if desired.

Moving Ahead

We dropped in on the Weidenhoff plant in Chicago the other day. What a far cry from this modern plant to the facilities that were thought sufficient some years ago. These people are particularly proud of their research laboratories which are equipped and manned for fundamental and applied research in every branch of the physical sciences.

Spectroscopy

With the growing interest in spectroscopic analyses in our industry, metallurgists and research men will welcome a new bulletin on the subject, just off the press. We refer to Bausch & Lomb's "Instruments for Spectroscopic Analysis." Not only does it describe equipment and its applications but there is a section on bibliography which should be most useful.

Mediterranean Notes

Norman Nairn, who gave the Far East its first modern bus transport, is one of the most interesting personalities we have met. He is over here to supervise the building of a new fleet of "desert" buses fabricated of stainless steel, fitted with airline seats, and air-conditioned. Light weight, coupled with Diesel power (Cummins), are the most vital factors in operating economy. We saw, too, some photos of the desert terrain. Can you picture a huge tractor-trailer bus laden with baggage and human freight hit a water hole at 60 m.p.h. so as to go through without being towed? That's the technique that gets them through, believe it or not.

100 Octane

Hitherto unknown fuel economies and performance are being disclosed with aircraft power plants designed for burning 100 octane gasoline. Already the supremacy of the Diesel for aircraft service is being disputed on this ground, with the result that we shall see much more aircraft Diesel activity than there has been since the day of the early Packard Diesel.

Third Edition

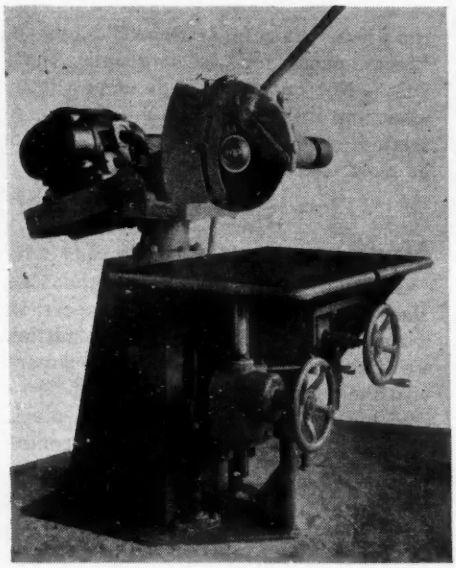
Word comes to us that the popular *Procedure Handbook* from the press of The Lincoln Electric Co. already has passed the 20,000 copies sold. 'Nuf sed.

J. G.

MANUFACTURING MANAGEMENT METALLURGY

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



Saves cutting time on castings

Tabor Brasive Cut-Off Machine Aids Foundry

The Tabor Manufacturing Co., Philadelphia, announces an abrasive cutting machine which is claimed to greatly reduce the time required in the foundry for the cutting of gates and risers from castings. By cutting clean and close to the body of the casting the necessity for snagging and finish grinding are often eliminated. The machine is said to be rigidly constructed, with a heavy base and a spindle mounted on tapered roller bearings. A multiple V-belt drive is used, the wheel and belts being guarded for protection of the operator. The table is easily adjusted for height and is made in halves which may be adjusted relative to each other to accommodate odd shapes.

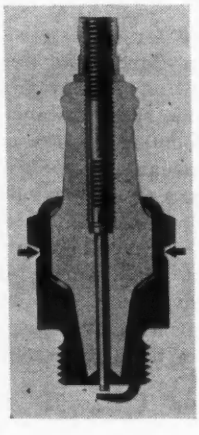
The Tabor Brasive cut-off machine may also be used for the cutting of bar stock, strip steel, tubing, structural shapes, etc.

Photoelectric Relay

A new photoelectric relay using Visitron photo tubes is announced by G-M Laboratories, Inc., Chicago. This unit is designed primarily for use on 110-120 volt, 50-60 cycle current, but is also available in other AC voltages and frequencies. The No. 5351-D relay illustrated uses a 3-in. lens aperature for increasing the sensitivity of the unit. Housed in a substantial steel cabinet, it is said to be suitable for any standard photoelectric application.

New Leak-Proof Design For AC Plugs

Important changes in the method of manufacture are said to be responsible for the leakproof construction of the new AC spark plugs. AC engineers point out that gas leakage results from a poor seal around the center electrode and between the insulator and the plug body. The center electrode problem, they say, was solved by the use of a two-piece center wire. Now through the development of new automatic machinery, electrically operated, the steel shell is heated to a red glow, permitting the shell and insulator to adjust themselves to each other while the metal is soft. Solid copper gaskets inside the shell mold themselves around the insulator, and when the heat is shut off shrinkage of the plug body makes the seal permanent.



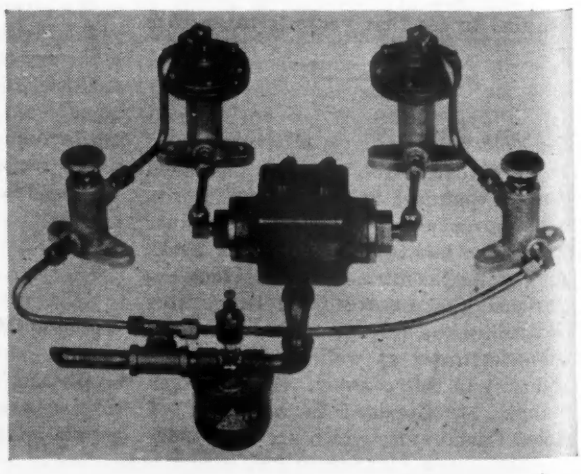
Sectional View AC Plug

Hopkins Remote Control Is Air-Operated System

A remote control operating valve system, making possible the automatic or semi-automatic control of a wide range of machines, has recently been announced by the Tomkins-Johnson Co., Jackson, Mich. The system, known as the Hopkins Remote Control, operates entirely by compressed air and uses either exhaust or pressure type power.

An entirely automatic and positive feed of clinch nuts to a clinching machine represents a typical small installation. In addition to the systems efficiency advantages, almost unlimited safety hookups are possible. Significant is the set-up for a large automotive press where hand stop buttons are piped in series to each man's station. All must be pressed before the machine can operate.

The accompanying illustration shows a simple pressure type system which includes the hand stop buttons at the extreme sides, the supplementary diaphragm buttons and the main valve in the center. Each system is supplied with a lubricator, piped in the supply line.



Hopkins remote control

New Cars More Dangerous?

(Continued from page 864)

on a mortality curve developed by John Scoville, statistician of the Chrysler Corp. This curve presents a national picture and consequently there is probably some error in applying it to a particular state. But the error is probably not large enough to invalidate its use for this purpose.

Of the 494 reports analyzed, 60 were on accidents involving 1936 cars and these were not included in the figures presented in the accompanying table since there was no way to estimate the number of 1936 cars in service at the end of 1935.

Summarizing the figures presented in the table, 3.77 per cent of the cars in service during the period were built prior to 1925 and were involved in no accidents; 24.79 per cent of the cars in service were built between 1925 and 1928 inclusive and were involved in 11.75 per cent of the accidents; 39.50 per cent were built between 1929 and 1932 inclusive and were involved in 35.95 per cent of the accidents; 16.84 per cent were built in 1933 and 1934, and were involved in 28.34 per cent of the accidents; and 15.10 per cent were built in 1935 and were involved in 23.96 per cent of the accidents.

Cars of 1936 model, which were eliminated in computing the foregoing percentages, had been on sale only three months at the end of the period covered by the survey, yet they were involved in 60 of the 494 accidents analyzed, which is more than for any year of manufacture prior to 1934.

Year of Mfr.	No. of Accidents	Percentage of Accidents	Percentage of All Cars in Service by Year of Mfr.
1924 and earlier	0	0.00	3.77
1925	5	1.15	2.94
1926	6	1.38	4.42
1927	15	3.46	5.93
1928	25	5.76	11.50
1929	40	9.22	15.70
1930	44	10.14	10.66
1931	30	6.91	8.19
1932	42	9.68	4.95
1933	45	10.37	7.01
1934	78	17.97	9.83
1935	104	23.96	15.10
Total	434	100.00	100.00

Wayne Lock Organized by Wayne Screw Products Co.

Officials of Wayne Screw Products Co. have organized the Wayne Lock Co. with capitalization of 250,000 shares. Rights to subscribe to 100,000 shares of the new stock at $1 a share are being offered stockholders of Wayne Screw Products Co. J. J. Corin, president of Wayne Screw, is president of the new company; F. Turner is vice-president and Walter Wolf, secretary-treasurer. Wayne Lock Co. will occupy a new building on which construction already is under way and which will be completed by July 25. It will have 20,000 sq. ft. of floor space and will cost $60,000. Operations are scheduled to start Sept. 1.

Texas Motor Exhibit

(Continued from page 857)

iature cars, the other featuring a novel fashion show, are other attractions.

The Ford building, constructed of steel, concrete and sheet rock is placed between the Federal building and the Court of Honor and houses 55,000 sq. ft. of exhibition space. The giant display of raw materials from the Southwest which are used in the production of Ford cars forms the chief attraction here. Sulphur is among the products not usually associated with motor cars and which are drawing much attention from the crowds.

The General Motors Auditorium, as the G.M. exhibit is known, features leather decorations with walls in shades of brown and blue. Several of the cars on the floor are finished in "Blue Bonnet" blue in tribute to the State flower of Texas. The General Motors safety car with small metal panels which shoot out to illustrate safety features, and Chief Pontiac, Indian robot, are the outstanding attractions.

It is reported that the opening day gate record was almost up to the Chicago mark, and that attendance to date has far exceeded expectations.

Louis F. Reinhard

Louis F. Reinhard, sales manager of the contract department of the Geuder, Paeschke & Frey Co., Milwaukee, automotive stampings, household utensils, etc., died June 2, aged 51 years. He was a 1907 engineering graduate of the University of Wisconsin, and had been an associate member of the Society of Automotive Engineers since 1922.

More Used Cars Financed in Canada

Ratio Is 214 per 100 New Cars, Compared With 134 in the United States

From 26 to 35 per cent of new Canadian motor vehicles have been financed by the major Canadian financing companies, during the past few years according to figures recently published by *Time-Sales Financing*. A survey conducted by that publication indicates that there are an additional 15 to 20 per cent which are financed through local banks or through the dealers themselves.

It is significant that in Canada there were 214 used cars financed in 1935 for each 100 new vehicles as compared with 134 used cars per 100 new units in the United States.

The accompanying table gives a complete breakdown of the Dominion financing activities showing number of units and dollar volume carried, contrasted with data on the sales of new vehicles.

Canadian Motor Vehicle Financing*

	RETAIL FINANCING DATA								NEW MOTOR VEHICLES					
	Number of Vehicles Financed			Value in Dollars—000 Omitted			Dollars per Vehicle		RETAIL SALES			Per Cent Financed of Total Sold	Average Per Cent Financed per Vehicle	Average Per Cent Financed of Total Dollar Volume
	Total	New	Used	Total	New	Used	New	Used	No. of Vehicles	Value 000 Omitted	Value per Vehicle			
March, 1936	9,377	3,149	6,228	3,899	2,177	1,722	691	276	11,600	12,001	1,035	27.1	66.8	18.1
February, 1936	4,593	1,451	3,141	1,914	1,007	907	694	289	5,412	5,566	1,028	26.8	67.5	18.1
March, 1935	7,185	2,540	4,645	2,981	1,757	1,224	692	264	10,961	10,896	1,012	23.2	69.6	16.1
1st Quarter, 1936	18,766	6,091	12,674	7,824	4,220	3,604	....	....	22,566	23,179	.....	....	....	....
1st Quarter, 1935	14,163	5,017	9,143	6,093	3,544	2,585	....	....	21,663	21,701	.....	....	....	....
Year 1935	100,178	31,950	68,228	40,343	22,411	17,932	701	263	100,961	101,286	1,003	31.6	69.9	22.1
Year 1934	76,170	23,264	52,906	30,091	16,365	13,727	703	259	73,358	75,785	1,033	31.7	68.0	21.6
Year 1933	54,238	15,880	38,358	20,158	10,030	10,128	631	264	45,332	45,450	1,003	35.0	62.9	22.1
Year 1932	69,291	21,293	47,998	25,865	12,741	13,124	598	273	45,870	45,261	987	46.4	60.6	28.2
Year 1931	98,623	33,988	64,635	41,942	20,870	21,072	614	326	.....	.....	.....	....	....	....
Year 1930	128,314	47,961	80,353	62,978	28,611	34,367	597	428	.....	122,165	.....	....	....	23.4
Year 1929	164,131	71,582	92,549	88,166	48,105	40,061	672	433	.....	.....	.....	....	....	....

* Figures from the Dominion Bureau of Statistics.

Two-Cent Fares for Railroads

(Continued from page 870)

patron who traveled average distances varying from 58.6 miles in 1923 to 74.1 miles in 1934, was much greater than in the "Commuter" group or those who traveled average distances varying from 14.3 miles in 1923 to 15.8 miles in 1934. As a result of that condition the number of "commuters" in relation to other long-haul passengers increased from 33.8 per cent in 1920 to a maximum of 65.5 per cent in 1932, but declined to 58.3 per cent in 1934. In that year the number of other passengers increased 6.3 per cent and the number of "commuters" declined 11.7 per cent.

The average rate of fare for "commuters" remained at about 1.10 cents per mile throughout the period shown, while the average rate of fare for other passengers declined from 3.41 cents in 1923 to 2.17 cents in 1934. The acceleration in this rate of decline from 1929 to 1934 reflects attempts of the carriers to attract more patronage by experimentation in reduced fares of various kinds. From 1920 to 1932 there was a decline of only 26.3 per cent in commuter travel, while that of other passengers declined 80.3 per cent. Of course, as the proportion of low commuter fares become greater, the average received from all passengers per mile traveled decreased.

It will be seen that up to and including 1929 there had been a gain of 9.7 per cent in commuter travel, as against a loss of 60.8 per cent in other travel. However, with the coming of the depression, commuter travel began to decline, but not as rapidly as other travel; on the other hand, this latter class of travel increased materially in 1934, while commuter travel continued to decline. This effect was probably produced by Southern and Western fare experimentations.

It should be remembered that the reduced railroad fares do not affect the commuter travel but are designed to increase the number of passengers and revenue derived from other classes of travel. From the tabulation it will be seen that if the Commission is correct in saying that prior to 1926 the passenger business of the railroads was profitable, then the average distance will have to be reduced to about 60 miles and the number of passengers hauled at the reduced fares will have to be greater than has ever before traveled by rail.

There are those who hold to the view that the railroad passenger business cannot be made profitable. The Commission found (Feb. 28, 1936)[11] that:

> "* * * prior to about 1926 rail passenger traffic was, in general, quite profitable. In that year passenger service expenses, including taxes and operating rents, but not interest, about equalled the revenues. Thereafter, deficits in increasing amount occurred until, in 1931, 1932 and 1933, for the country as a whole, they exceeded $200,000,000 annually."

A discussion of that feature of the Interstate Commerce Commission's decision will require the use of terms commonly used in the railroad world and which are rather confusing to one unfamiliar with them; however, they can be easily made into simple language. For instance, a passenger-mile is an average figure obtained by finding out how far each passenger traveled; the total obtained by adding those individual distances is the passenger-miles. Treat each train in the same manner and you obtain the passenger-train-miles, then take the passenger cars and find out how far each traveled and add the results and you have the passenger-train car-miles. The term "revenue passenger" is one who pays his way, as contrasted with a "dead head," or a man traveling on a pass. "Passenger revenue" is the amount of money received from passenger fares.

Will New Rail Rates Be Profitable?

If passenger revenue was only about equal to operating expenses and there was nothing left over to pay bond interest in 1926, as stated by the Commission, then, in order to return to even that unhappy state, the future passenger revenue per car-mile will have to be double (20.9 cents) what it was in 1934. Passenger revenue per car-mile was 41.9 cents in 1926. Then there were

[11] 214 I.C.C. 179.

Table C—Bus Operation in East, South, and West

Years January 1	NUMBER OF BUSES			PERCENTAGE OF CHANGE		
	Eastern	Southern	Western	Eastern	Southern	Western
1930	22,158	3,830	10,627	.....	.....	.....
1931	23,997	3,813	11,108	+ 8.3	− 0.5	+ 4.5
1932	26,135	3,773	10,898	+ 9.0	− 1.0	− 1.9
1933	25,716	3,498	11,065	− 1.6	−10.0	+ 1.5
1934	21,100	2,477	9,664	−18.0	−29.0	−12.7
1935	22,322	2,652	9,030	+ 5.8	+ 7.1	− 6.6
Change from 1931	−1,675	−1,161	−2,078	− 7.0	−30.5	−18.7
Change from 1930	+ 164	−1,178	−1,597	+ .8	−30.8	−15.0

14 revenue passenger-miles per car-mile. To one unfamiliar with these statistics, it may not seem a far cry from the latter figure to 11 revenue passenger-miles per car-mile in 1934, but it is. In order to achieve that, on the basis of 1934 car-miles, you would have to find 192,000,000 new riders to pay fares, and if you did that your revenue passengers would be up about half way between those of 1930 and 1931. However, the Commission said the railroads lost $200,000,000 on their passenger business in each of those years. Of course, if the same number of passengers traveled at a lesser rate of fare, the deficit would be greater.

Now if, as the Commission says, passenger business was remunerative prior to 1926, then we would have to boost the patronage to somewhere between 15 and 16 revenue passengers per car-mile, as existed from 1923 to 1925, and increase passenger revenue per car-mile to somewhere between 43.5 and 49.2 cents, say 15.5 passengers per car-mile and 46.5 cents for passenger revenue per car mile. That, however, is on the basis of the old 3.6-cent fare plus the surcharge, and not on the new fare basis of 1½ and 2 cents in coaches and 3 cents in parlor and pullman cars. To obtain 46.5 cents for passenger revenue per car-mile on these rates of fare requires a far greater number of revenue passengers per car-mile than rode the trains from 1923 to 1925.

Now to get 46.5 cents with a fare of 1.5 cents per passenger, you must have 31 revenue passengers per car-mile. Such a figure has never been attained by the railroads of this country as a whole.

During those happy railroad passenger days the Commission speaks of in its decision, when the railroad passenger business was profitable, the average fare paid was 2.98 cents per mile. In this, however, was included the passenger fares paid by the "commuters." Their average rate per mile was only 1.10 cents and they represented 18 per cent of the passenger-miles. "Commuters" pay about the same rate of fare now as then. When they are eliminated, it is found that the average per-mile fare paid by all other passengers was 2.17 cents in 1934, 3.35 cents in 1926 and 3.40 cents, on the average, for the three years from 1923 to 1925.

It does not take any great amount of brains to realize that if it is the average revenue you get per mile from the operation of, say, a passenger coach, bus, taxicab, ox-cart, or any other conveyance, which, in order to be profitable, must equal 46.5 cents, then you can, by primary school arithmetic, ascertain what your probable patronage will have to be at different rates of fare. Making this determination in the matter of the new railroad fares is not difficult. For instance, a 3-cent fare divided into 46.5 cents tells you that you must have an average of 15.5 passengers in each vehicle for each mile it runs; 2 cents would require 23.25 passengers, and a 1½-cent base would require you to find 31 passengers to ride each mile the vehicle travels. We know that the last figure is out because past experience shows it is nearly twice as high as has ever been possible to attain for the railroads as a whole.

It may be possible to make the passenger business pay a better proportion of its own operation, but if it takes 46.5 cents in passenger revenue for each passenger car-mile in order to be profitable, then insofar as the railroads as a whole are concerned, the passenger business with present passenger coaches pulled by steam locomotives is out as a source of profit, and even as a source of revenue from which to pay its proportion of interest. Frequent motorized service may evenutally be adopted to furnish what the public demands. The reductions made in fares in the South have been helpful, but less favorable results are seen in the West. What the East can get in the way of passenger revenues from the 2 and 3-cent fares only time can tell. According to the Atlantic-Greyhound Company, it costs 19.29 cents per bus mile to operate 27-passenger buses, contrasted with 41.9 cents per car-mile, said by the Commission to be the 1926 cost.

The Effect of Reduced Rail Fares on Bus Transportation

It is difficult to ascertain the effect of the experimental railroad passenger fares upon bus operations because of the lack of authentic bus records. However, using the *Bus Transportation* census as a basis, it is possible to segregate the buses into the several railroad rate districts in order to observe the effect of that experimentation. Such a separation is shown in Table C.

From this analysis it will be seen that the greatest decrease in the number of buses in use was in the Southern District, where the Southern Railway System has been conducting very extensive experiments in coach fares ranging from 1 to 2½ cents per mile. It will be recalled that on Sept. 15, 1932, that system began to conduct its final experiment with the 1½-cent-per-mile fare, which was gradually extended over the whole system by Dec. 1, 1933, on which date all Southern District carriers adopted the Southern System fare. It will be observed that while these experiments were in progress from Jan. 1, 1930, to Jan. 1, 1934, the decrease in the number of buses was rather startling; however, when the fare was stabilized so that bus companies knew what the adopted fare was going to be, there was a rather decided upturn in the buses in operation. In fact, it was the first year in which the number in operation showed an increase since Jan. 1, 1930.

In the Western District, where experiments of various kinds had been taking place for some years, consisting mainly of excursion low round trips and special fares, the decline was not as marked. However, on Dec. 1, 1933, the 2-cent coach fare was adopted for all Western carriers, which apparently had a marked effect on the number of buses in use. The reduction in number from 1930 to 1935, however, was only 15.0 per cent, contrasted with 30.8 per cent in the South, where the 1½-cent fare was in vogue.

Bus Revenue Up Despite Lower Railroad Fares

The regular fare (3.6 cents) authorized by the Interstate Commerce Commission in 1920 was adhered to in the East throughout the period, although excursion, low round trip, and special fares were available to the public. In that section of the country there was a smaller percentage increase (5.8) reported on Jan. 1, 1935, than in the South (7.8), where the lowest (1½ cent) coach fares were in competition with buses.

From this character of analysis it is quite apparent that the lowest rates in the South and West had a detrimental effect on bus operations.

Regardless of the experimentation in low coach fares which has been going on in the South and West since December, 1933, the motor bus industry reports passenger traffic gains for the first three months of 1936 over the previous year. The business of the intercity companies showed 6.82 per cent increase, a higher rate of increase than city or suburban lines which were unaffected by the low rail fare. The basic passenger fares on intercity lines were somewhat lower in 1936, the average fare paid during the first three months of 1935 was 60.45 cents; in 1936 it was 58.29 cents for the country as a whole. These favorable operating results are particularly significant when it is recalled that the past winter has been an unusually severe one.

A rather significant fact indicating that bus operators are not disturbed about reductions in rail fares is that during 1935 bus deliveries (3514) for common carrier use were 60 per cent higher than in 1934 and were greater

than the combined deliveries of 1932 and 1933.

Under the Commission's decision approving the experimental fares, the Southern and Western motor carriers could start their own experimentation if they lose business to the railroads. Certainly if, as stated by the Commission, in reducing passenger fares and surcharges, it is necessary to reduce rates because those already in existence do not produce enough revenue to pay expenses, then when any motor carrier is faced with the same situation it should, on the same theory, be permitted to experiment with rates to get back its lost patronage and revenue.

Obviously such a theory of regulation may well produce a "vicious circle" which cannot logically be broken. To do other than accord bus operators the same measure of protection in the matter of their patronage would be favoring one class against another where both are subjected to the same regulatory authority, each having a right to expect similar treatment.

How the Bus Is Meeting Competition

As the existing coach fares of 1½ cents per mile in the Southern District and 2 cents per mile in the Western District will not be changed by the order fixing maximum rates, there was no need for changes in bus fares to meet rail competition in any section of the country except in the Eastern District. In anticipation of any adverse effect from the 2-cent rail coach rate, the Northeastern Bus Traffic Association has filed new tariffs with the Interstate Commerce Commission reducing interstate passenger fares to levels of 2 cents or less a mile, effective as of April 1. These tariffs apply on 300 bus lines operating in the Northeastern section of the country. The Central Greyhound Lines drastically cut their rates, effective April 1, between Chicago and Boston. Table D shows the new and old rates by rail:

The margin of difference between the new bus and rail rates was materially reduced on June 2. Competitive fares so far adopted indicate that 1¾ cents per mile will be generally used by Eastern bus lines as a basis.

Conclusions

From what has gone before it can be concluded that the railroads as a whole cannot attract enough patrons to make the passenger business pay its way, much less yield a profit. However, where passenger trains must be operated, whether profitable or not, there may be greater revenue than during the depression. Roads aggregating nearly one-half of the railroad mileage have little interest in passengers. Eventually buses and trucks must be substituted for rail equipment on other thousands of miles of unprofitable branch lines.

The continued growth of the bus business is inevitable, particularly for short-haul passengers and where rail service is inadequate; however, existing regulations will force many small operators out of the transportation field and promote greater combinations of interest resulting in fewer competing lines; that is, greater monopoly in that business. The combination of organized science, research and invention now working in the motor vehicle field holds out greater possibilities for lower operating costs.

The use of private automobiles will tend to decrease, if at all, rather from the continually increasing tax burden than from the reduced rail rates. Few private owners consider costs except that of gasoline and oil, and these are so low on the per-mile basis that where two or more people travel, no rail fare, however low, would attract them[12]. Even in railroad commuter territory, with 1.1 cents per mile the private automobile has effectively reduced rail patronage.

Finally, the hope of the railroads lies in attracting new riders, not from the buses or private automobiles, but from that vast section of the population most severely hit by the depression and which is, obviously, just beginning to buy transportation again. That vast field, however, is available alike to the bus operator, the automobile salesman, and the railroad.

In conclusion, greater business for the railroad means a large degree of employment, which in turn opens new opportunities for the manufacture and sale of more products of the automotive industry.

[12] 214 I.C.C. 260, Commission Meyer dissent.

Table D—Showing New and Old Rates for Bus and Railroad

Points Between	Rail Distance Used Miles	Bus Old Rate	Rail Old Rate	Bus New Rate	Rail New Rate
Buffalo—Chicago	525	$ 9.00	$18.81	$ 7.75	$10.50 *
Buffalo—Washington	435	11.50	15.71	7.00	8.70 **
Buffalo—New York	435	9.00	15.72	6.15	8.70 *
Buffalo—Boston	493	10.00	17.82	7.45	9.85 *
Buffalo—Rochester	60	2.00	2.38	1.00	1.20 *
Buffalo—Cleveland	185	4.00	6.64	3.00	3.70 *
NewYork—Philadelphia	93	2.00	3.24	1.50	1.85 **
New York—Pittsburgh	440	9.00	15.82	6.25	8.80 **
New York—Baltimore	185	4.50	6.70	3.10	3.70 **
New York—Washington	225	5.50	8.14	3.75	4.50 **
New York—Chicago	908	16.00	32.70	12.95	18.15 **
Washington—Pittsburgh	300	6.50	10.90	5.25	6.00 (1)

*—Based on New York Central Mileage.
**—Based on Pennsylvania Railroad Mileage.
(1)—Based on Baltimore and Ohio Mileage.

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Just Among Ourselves

(*Continued from page 875*)

to take the road to ruin. For when governments attempt more than men with their abilities are fitted to do, the more they attempt, the worse they will do it. The men who said that this must be a government of limited powers were men who understood mankind.

* * *

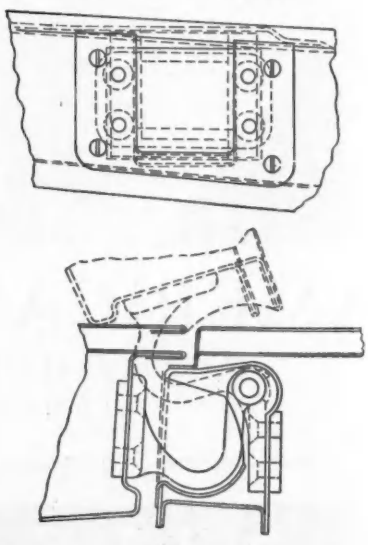
"It took centuries to achieve the separation of Church and State, the separation of the press and the state, the separation of learning from the state, the separation of the judiciary from the executive. And in this separateness the modern progress of mankind has taken place. Let us, therefore, be on guard against a reaction, masquerading as enlightenment and progress, which would amalgamate them all again and undo the hard won achievements of the emancipators of mankind.

—J. C.

Memphis Body Plants To Reduce Operations

The Fisher Body Co. plant at Memphis will cut its operations to a third about Aug. 1, Keith Spurrier, manager, announced. Because the 1937 Chevrolet bodies manufactured by General Motors Corporation will contain a minimum of wood, activities at the plant will be curtailed as soon as the 1936 body building schedule is completed and building of the 1937 bodies gets under way. The force of 3500 will be reduced to about 1200 or 1300. Some of the men will be transferred, however, to other plants. While the Fisher plant will cut operations, Murray will be closed entirely it is said.

Ackerman Blaesser Concealed Hinge



A door is permitted to open 70 degrees with this new hinge